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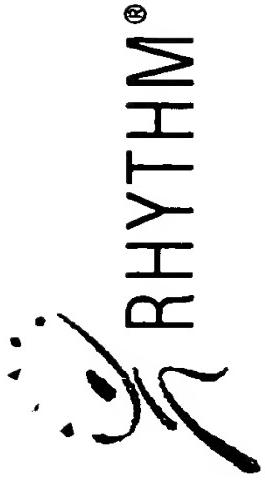
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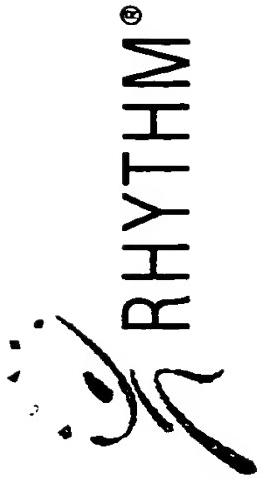
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Rhythm Global Decision Support Solutions

“Driving Global Competitive Business Dominance
Through Multi-Enterprise Business Optimization”

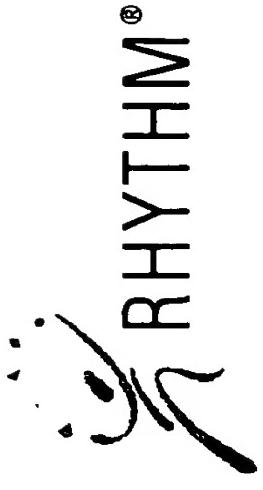
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**i2 provides solutions
that enables people to
make optimized decisions**

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Rhythm Optimization Definitions

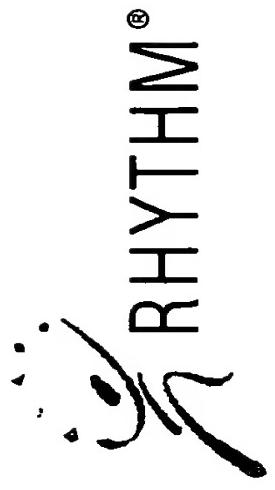


- **APS Engine:** Individual module which, on a stand alone basis, represents and solves a specific component of an overall business problem

Example: Rhythm Factory Planner solves the manufacturing component of a total supply chain optimization problem
- **Resolvers:** Algorithms that represent and solve a specific constrained problem within an overall APS module

Example: Rhythm Supply Chain Planner uses heuristic resolvers in the form of business logic rules to generate feasible solutions

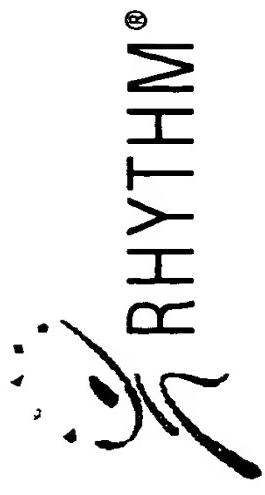
Rhythm Optimization Definitions



- **Solutions:** Collection of APS engines which combine to solve a customers business problem
Example: Master Planning solution which involves Rhythm Forecast Planner, Rhythm Supply Chain Planner, Rhythm Factory Planner and Rhythm Sales & Operations Planner
- **Multi-Engine Solutions:** Solutions which involve an interaction among multiple APS engines in order to achieve optimization
Example: Rhythm Supply Chain Planner drawing on Rhythm Factory Planner and Venture Freight Optimizer to generate an integrated supply chain optimized solution spanning manufacturing and distribution

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Potential North American Retail Supply Chain Benefits



Current Status

- Total Cost: \$1,200 Billion
- Inventories: \$800 Billion
- Lost Sales: \$180 Billion

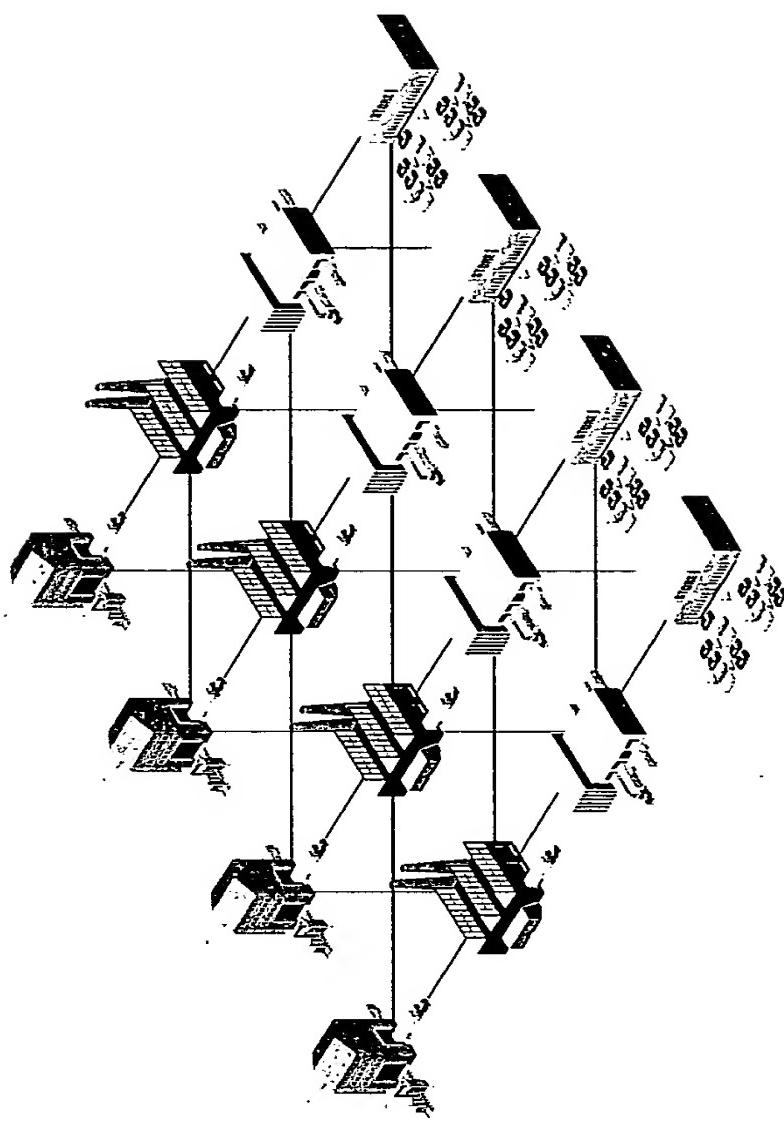
Potential Benefits

- Total Cost Reduction: 25%
\$300 Billion/YR
- Inventory Reduction: 50%
\$400 Billion/YR
- Increased Revenue: 10%
\$120 Billion/YR

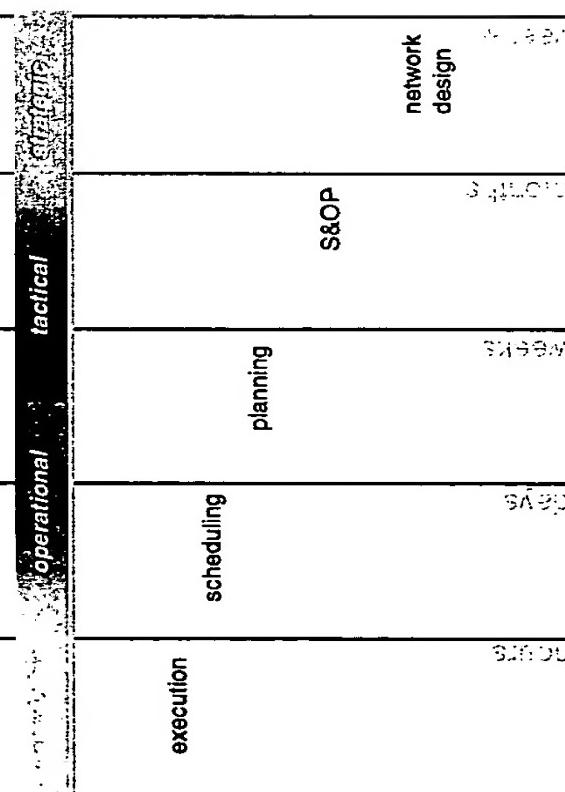
*Sources : Benchmarking Partners,
Voluntary Inter-Enterprise Commerce Standards (VICS)*

Optimized Decisions: Business Drivers

- Supply Chain Complexity
- Timing

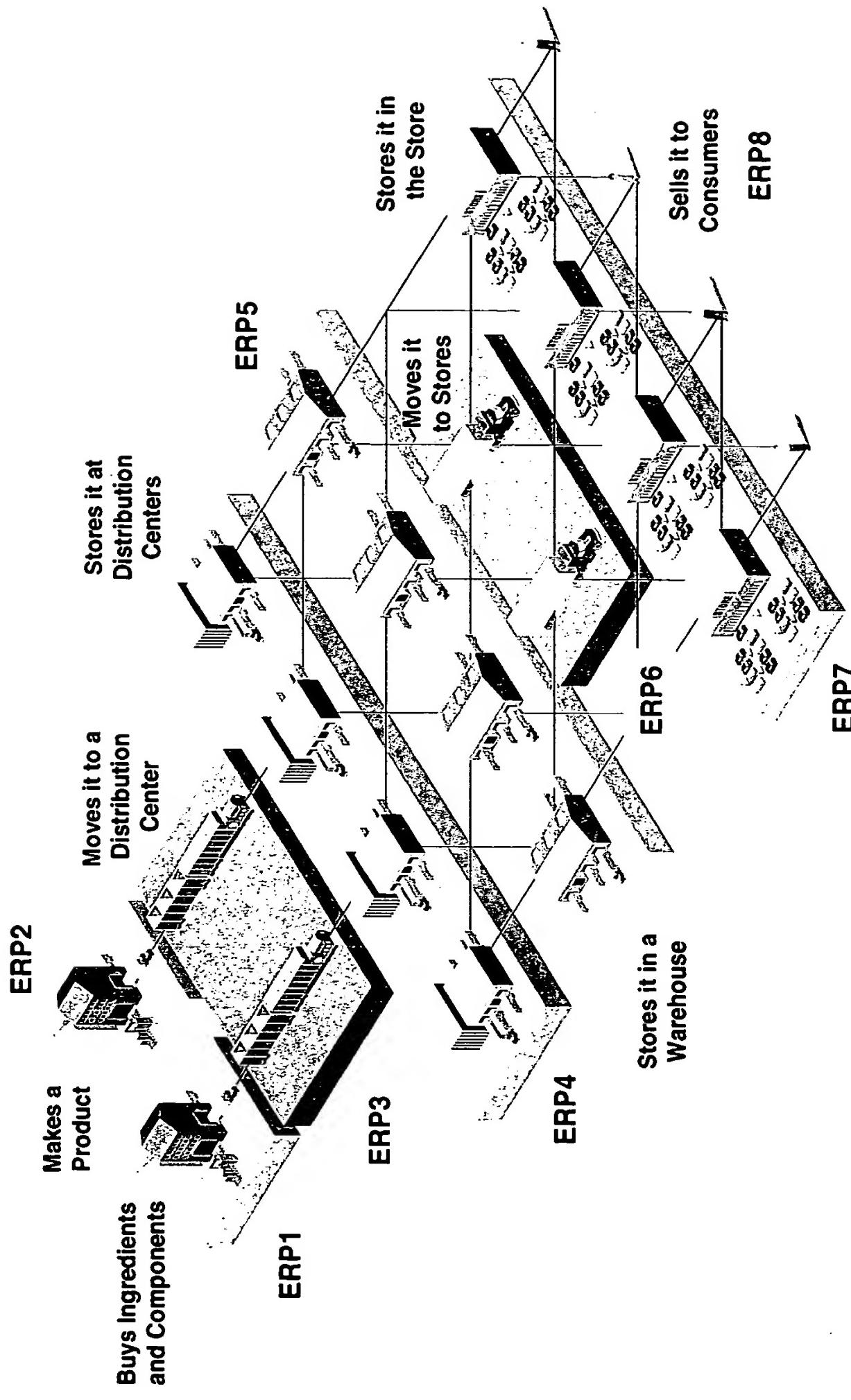
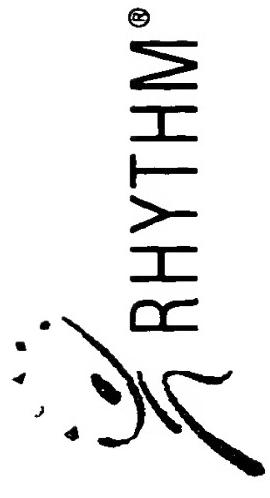


The Planning Funnel



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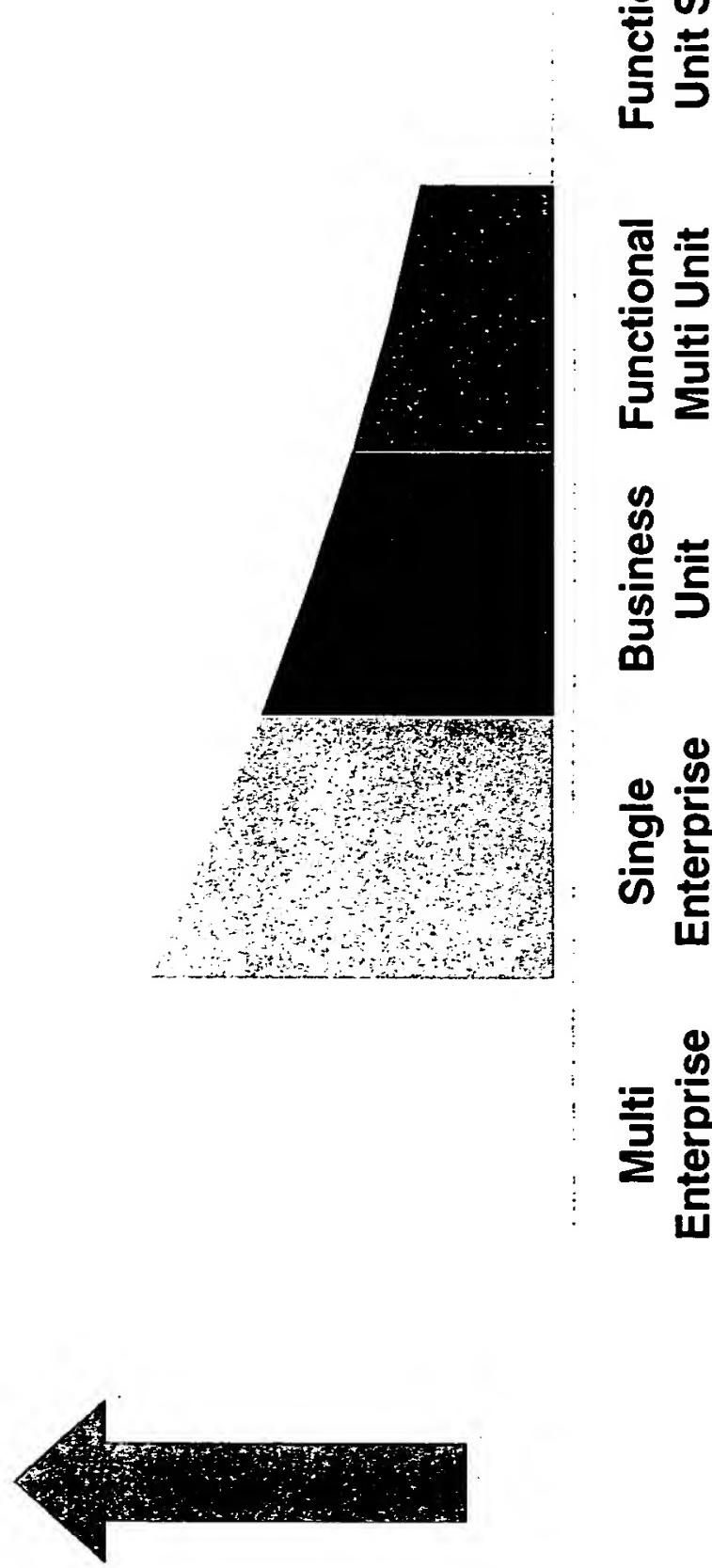
Business Challenge: Multi-Enterprise Supply Chain



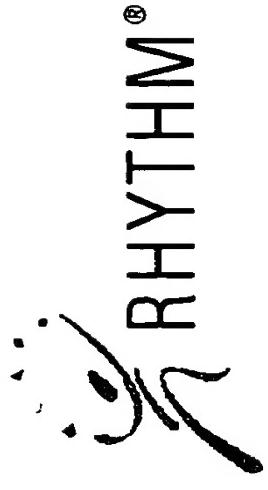
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The Potential Impact on ROA Increases Dramatically Over Multiple Domains

ROA
Impact

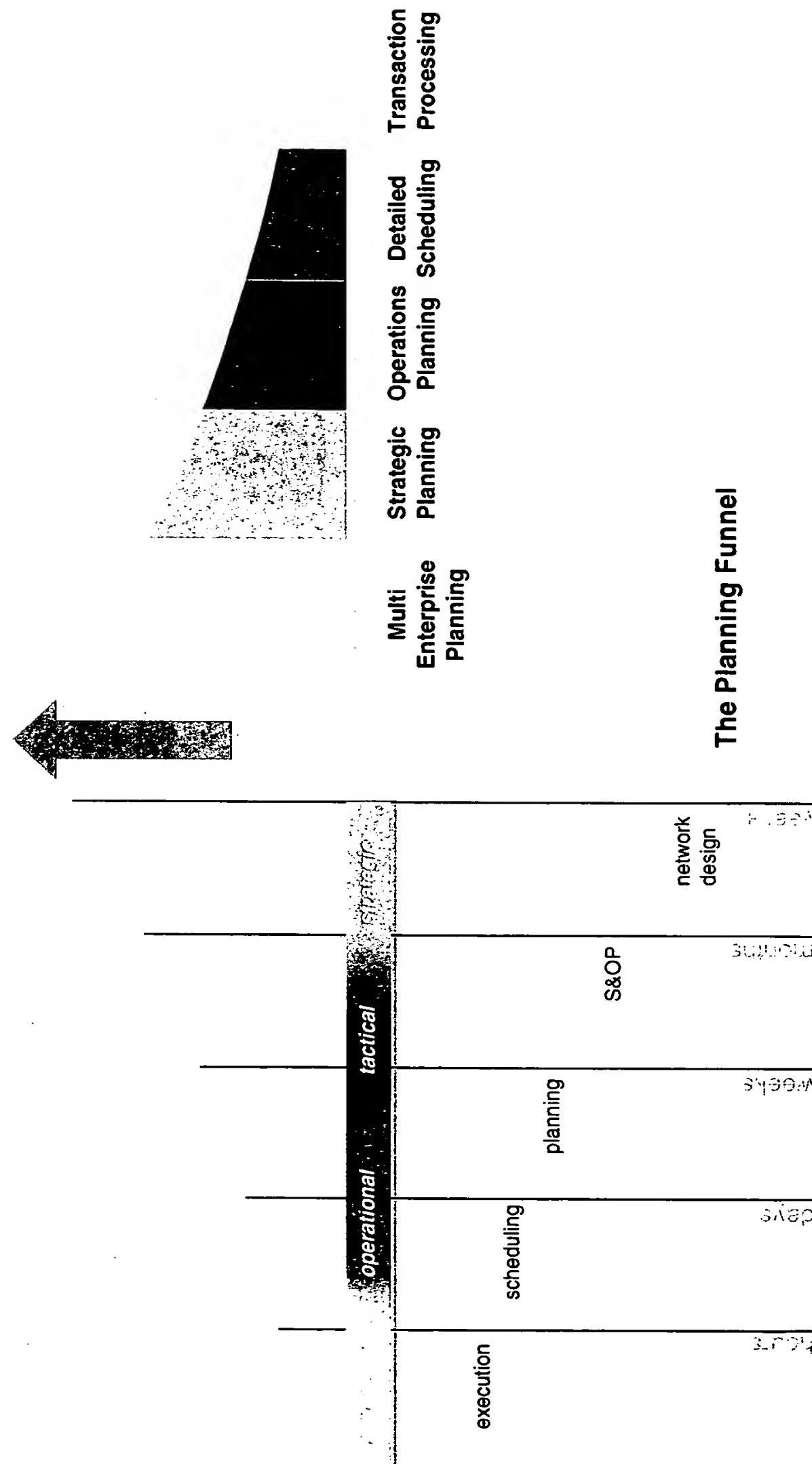


Business Challenge: Multi-Enterprise Supply Chains



- **Integrated supply chains** are increasingly being pitted against each other for dominance and survival
- **Harmonizing multiple control domains:**
Functional Silos, Business Units, Enterprises
- **Solution integration of multiple business processes,** as well as integrating planning, execution, monitoring and control phases
- **Single face to customer/supplier** across all domains maximizes leverage
- **Benefits flow from maximizing customer service and revenues, and minimizing total delivered cost and resources**

The Potential Impact on ROA Increases Dramatically Over Time

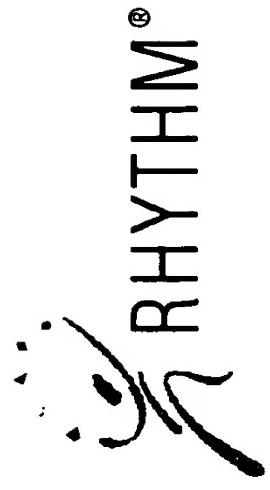


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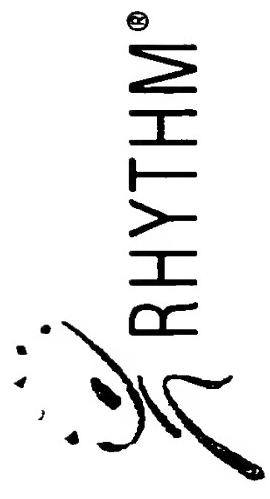
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Business Challenge: Timing of Decisions



- **Planning Funnel** scope drives ROA impact potential through increasing number of options and degrees of freedom
- **Advanced Planning and Scheduling (APS)** systems, which can simulate alternatives and recommend solutions, are central to optimal decision making, resource utilization and return on assets
- **Advanced Early Warning Systems** are critical to providing maximum response time and the best solutions

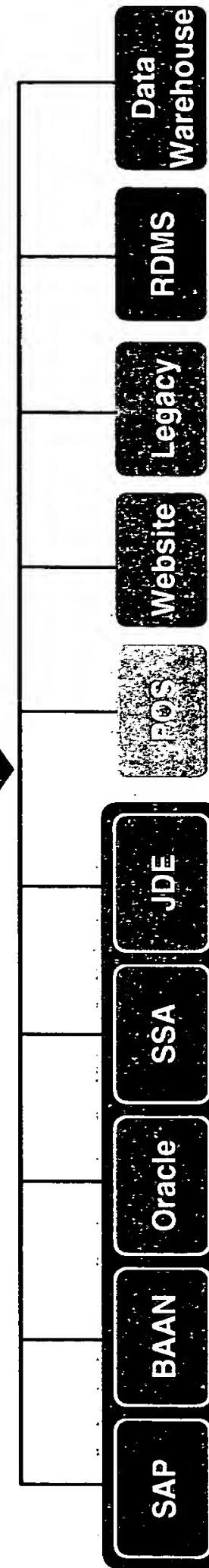
Technology Challenge: Diversity



Multiple Engine
Optimization

Global Optimized Decisions

Single Engine
Optimization



Data Examples

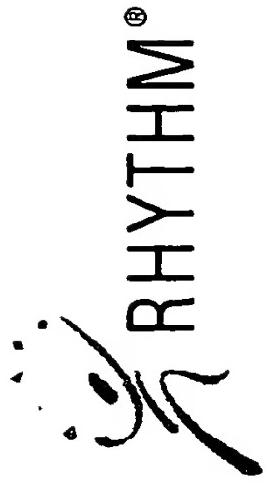
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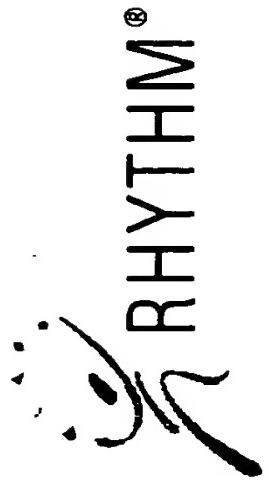
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Technology Challenge : Requirements to Enable Maximum ROA

- **Optimize across** multiple decision support engines
- **Integrate** the complex array of technology platforms, data dictionaries, etc.
- **Rapidly deploy** new technology
- **Access, configure, and share** information easily
- **Display** multi-source data in common framework
- **Closed loop** decision making across multiple control domains



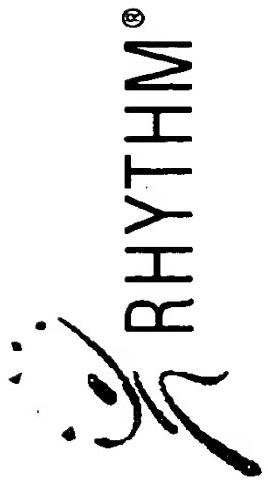
Technology Providers Roles



- **APS Vendors**
provide solutions that enable people to make **optimized decisions**
- **ERP Vendors**
provide software that is best suited for **executing and tracking transactions**
- **Database Vendors**
provide solutions for **database management**
- **Hardware Vendors**
provide solutions for **infrastructure**

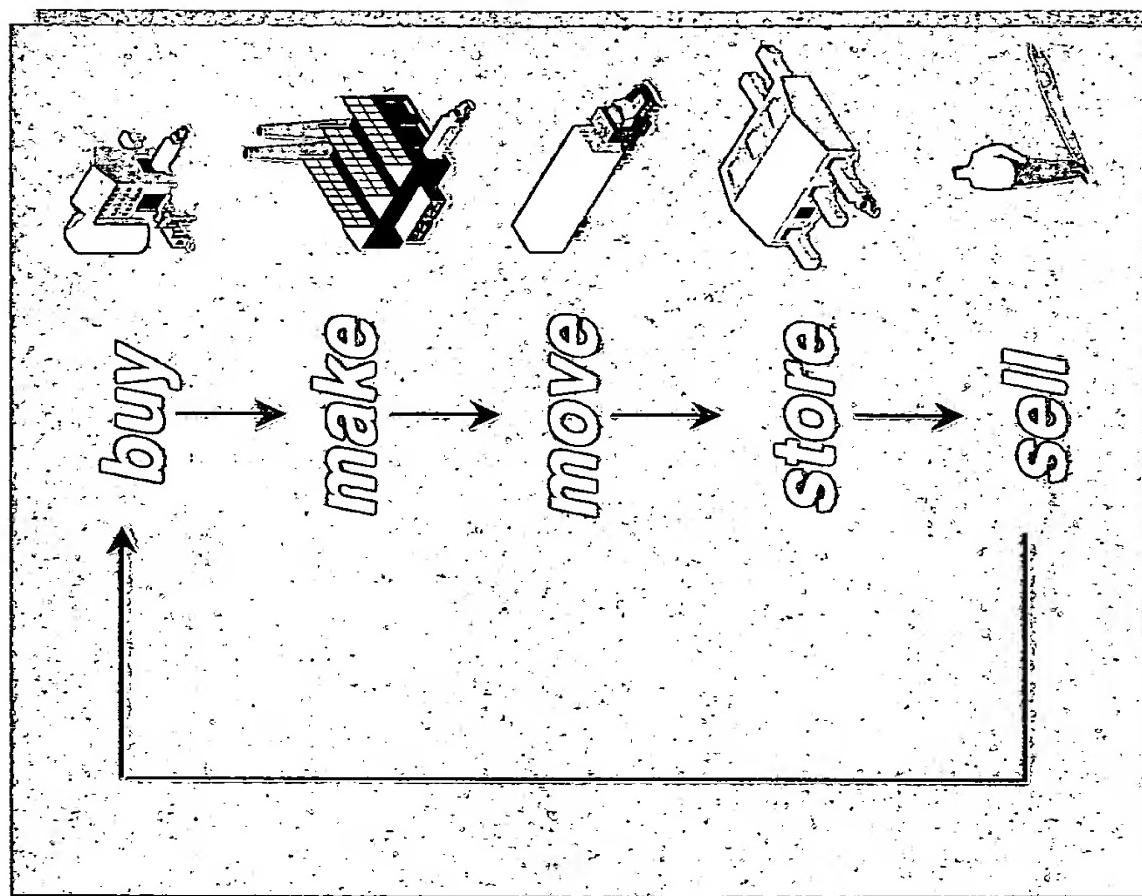
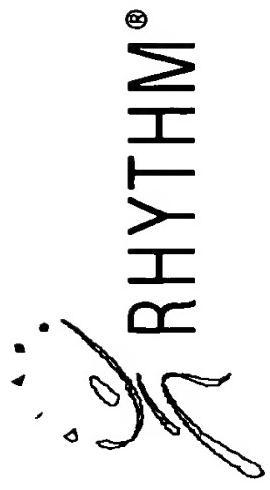
Optimal Decision Support Requires World Class Solutions

- World Class Applications
- World Class Architecture
- World Class Partners



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**Example: Global Supply Chain
Planning Enables Optimal
Decisions for Business to:**

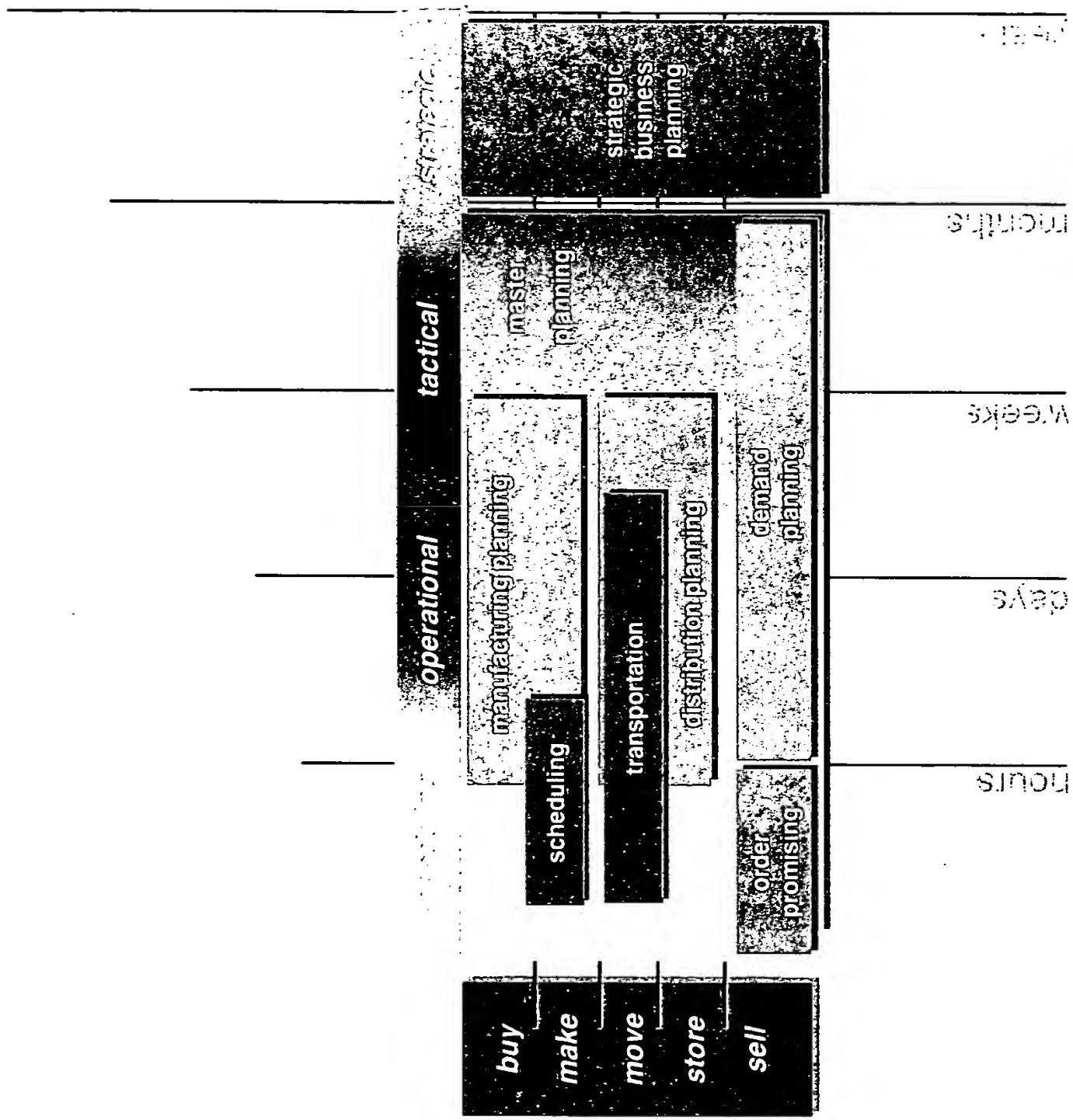
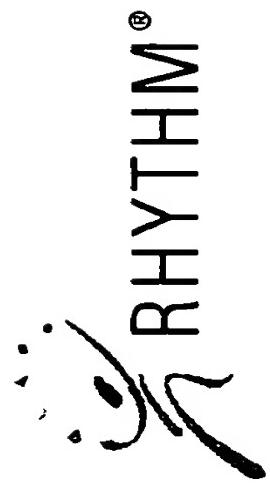


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Solution Overview

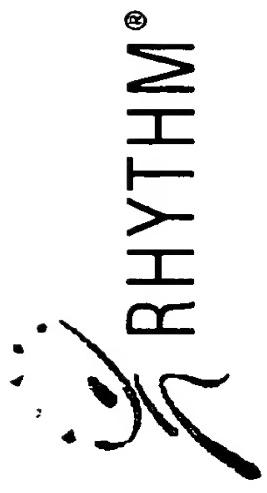


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Planning Funnel: Key Business Solutions

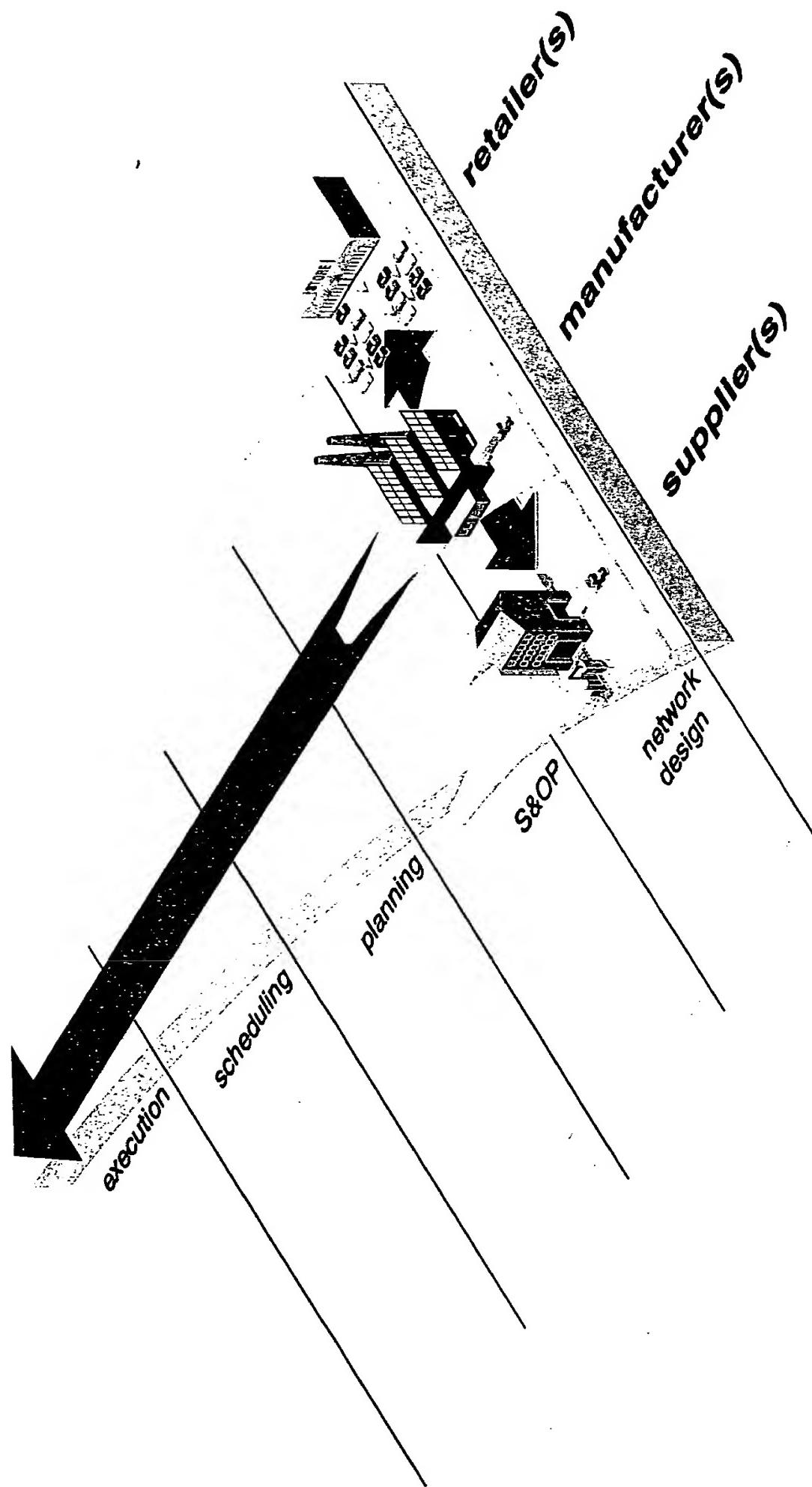
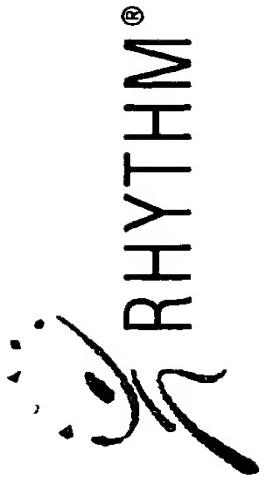


Supply Chain Segment Key Business Solutions

- Strategic Planning
 - Product Portfolio
 - Supply Network Structure
 - Acquisitions/Divestitures
- Tactical Planning
 - Demand Creation
 - Demand/Supply Optimization
 - Inventory Optimization
- Operational Planning
 - Promotion Planning
 - Sales & Operations Planning
 - Resource Optimization
- Scheduling
 - Demand Fulfillment
 - Production Sequencing

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Multi-Enterprise Planning

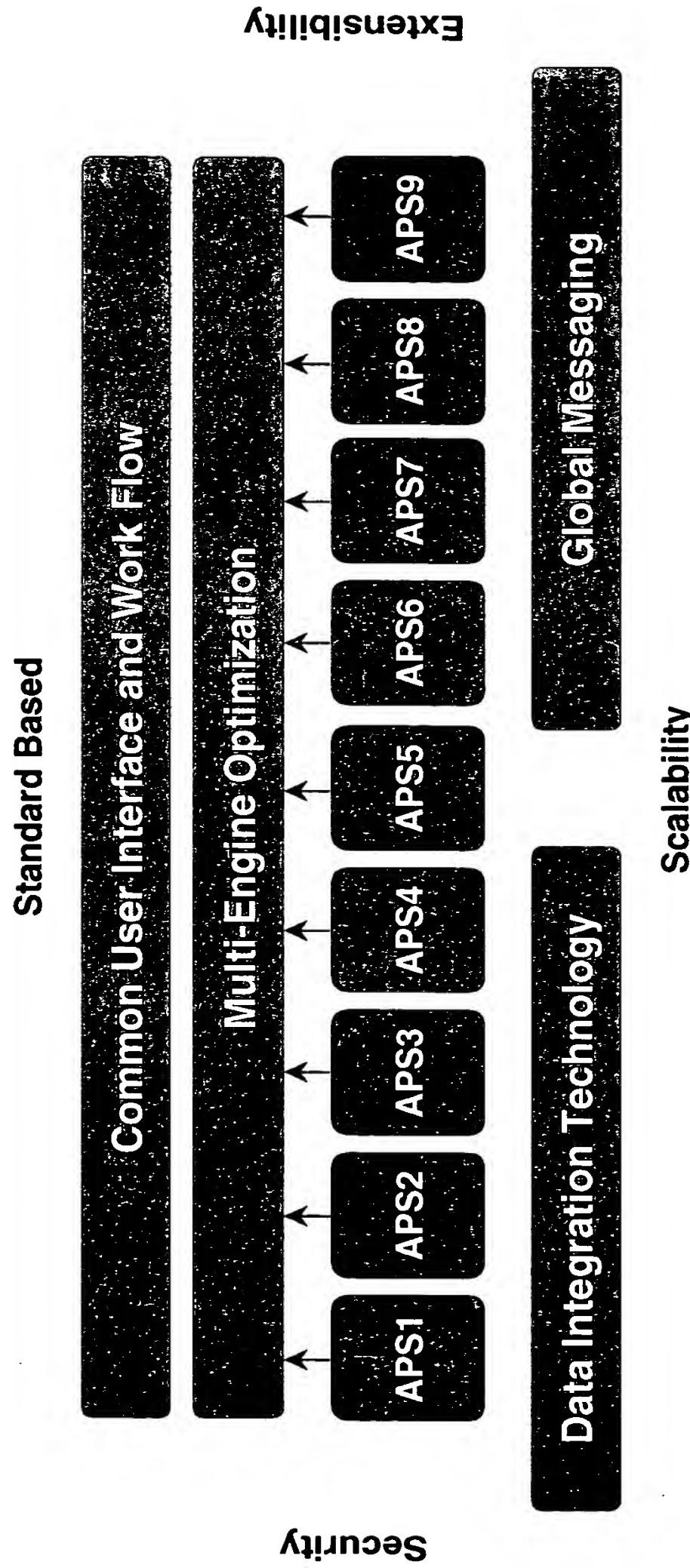
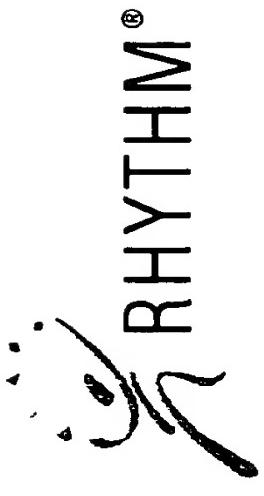


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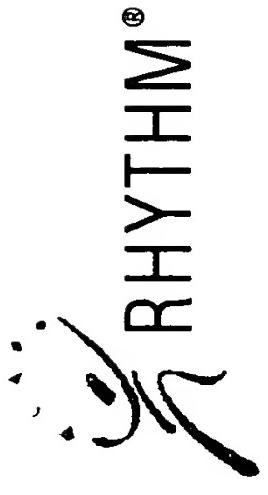
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World Class Decision Support Solution Characteristics

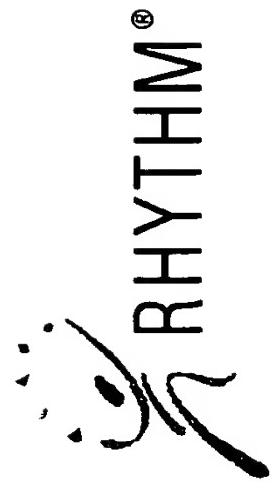


World Class Decision Support Solution Characteristics



- ▷ **Optimization:** Single and Multiple APS engines
- ▷ **Data Integration:** Multiple sources and definitions
- ▷ **Global Messaging:** Closed Loop Dialogue
- ▷ **GUI:** Single UI Infrastructure and Integrated Workflow
- ▷ **Commonalities**
 - Standards Based: Non Proprietary
 - Secure: No unauthorized access
 - Extensible: Users can augment capabilities
 - Scalable: Number of simultaneous users and solutions

World Class Decision Support Solution



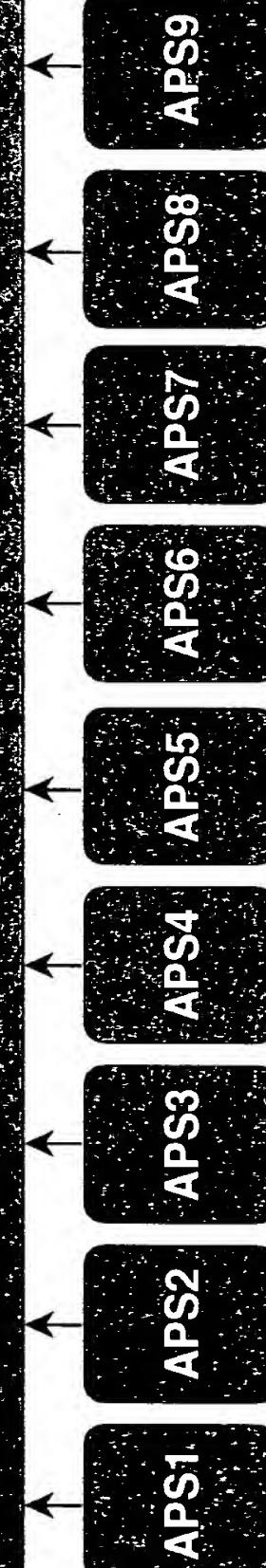
Standard Based

Common User Interface and Work Flow

Multi-Engine Optimization

Security

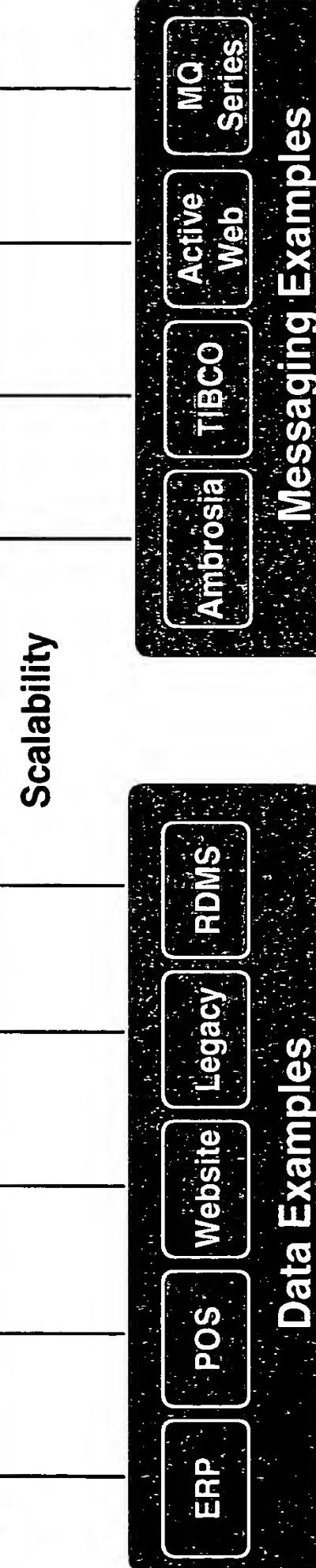
Extensibility



Data Integration Technology

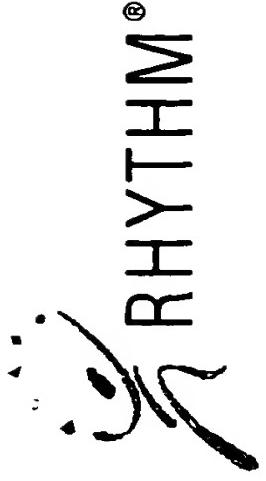
Scalability

Global Messaging



Data Examples

Messaging Examples



i2 Announcements

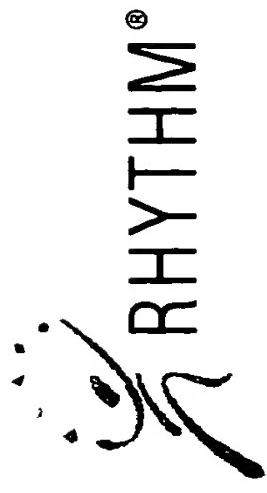
Rhythm Decision Support Architecture

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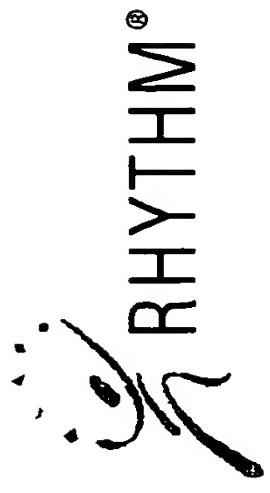
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Rhythm Decision Support Solution Characteristics



- **Rhythm Optimization:** Single and Multiple APS engines; including non i2 engines
- **RhythmLink:** Multiple information sources and data definitions; bi-directional and simultaneous information flow
- **RhythmLink:** Many to Many Closed Loop Dialogue and Collaboration

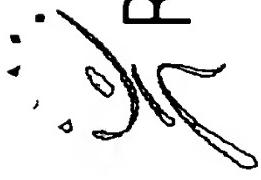
Rhythm Decision Support Solution Characteristics



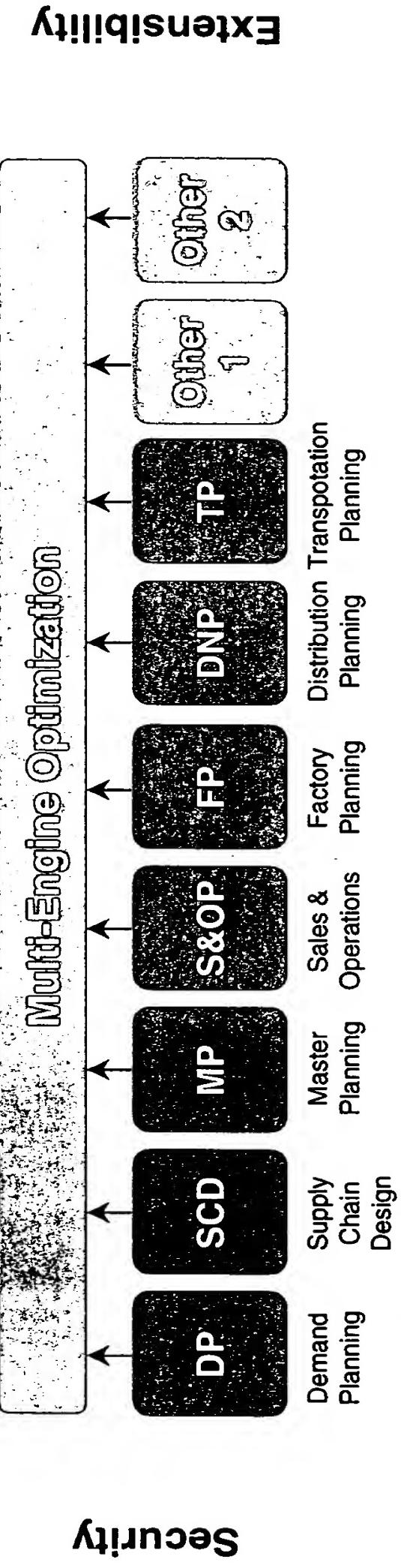
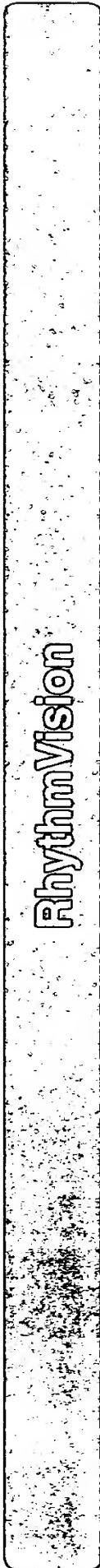
- **RhythmVision:** Multi source Common UI Infrastructure and Wizards based multi-engine Integrated Workflow
- **Rhythm Commonalities**
 - Standards Based: Java, CORBA, DCOM
 - Secure: Client and Server level, down to individual objects
 - Extensible: Users can augment capabilities; modular
 - Scalable: Number of simultaneous users and solutions; multi threaded

RHYTHM Decision Support Architecture

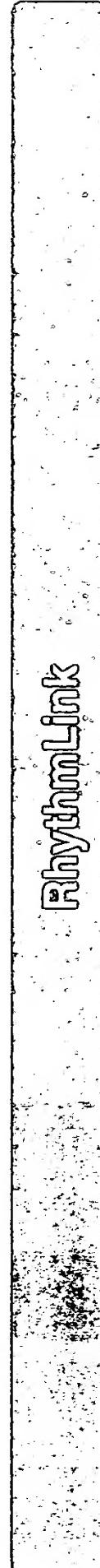
RHYTHM®



Standard Based



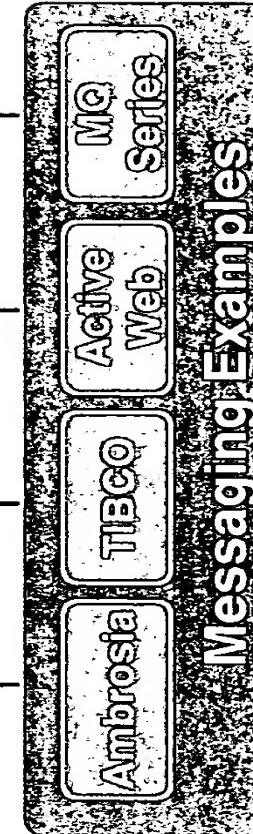
Security



Scalability

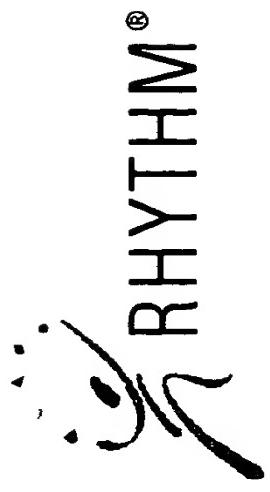


Messaging Examples



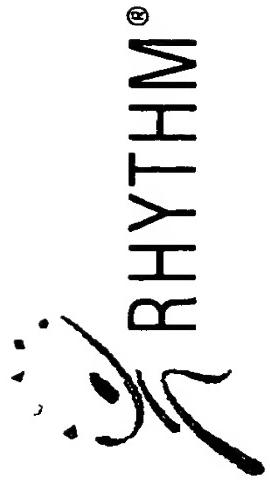
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Solution Characteristics: World Class Applications



- **Comprehensive Problem Representation**
Example: Model complex multi enterprise multi stage supply chain
- **Constraint Based Optimization**
Example: User defined optimization while respecting real world capacity, materials and supply limitations simultaneously
- **Speed**
Example: Due Date Quoting on complex customer phone order
- **Collaboration**
Example: Multi Vendor End Isle Promotion Planning

Business Value

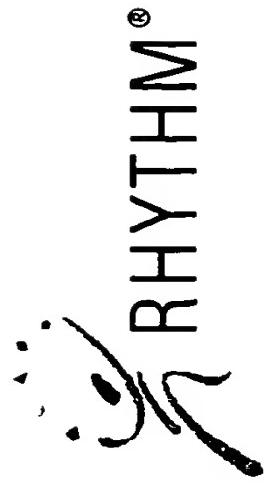


World Class Application Characteristics

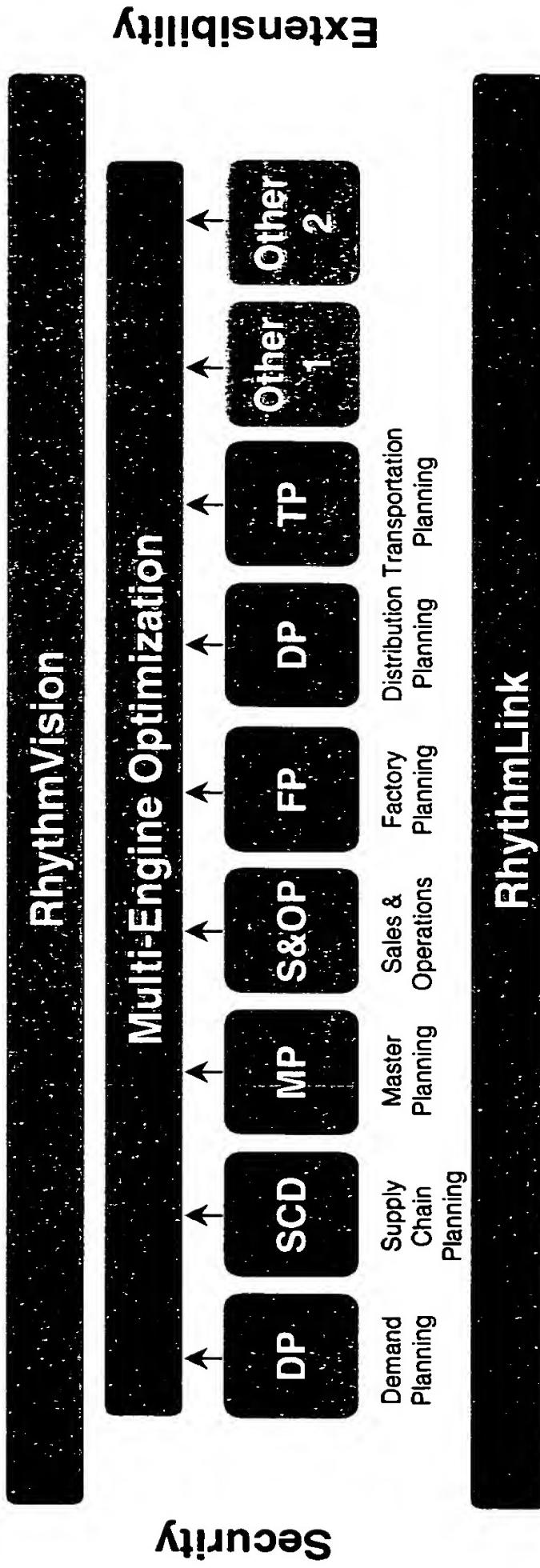
- Comprehensive Problem Representation
 - Feasible Solutions
 - Complete Solutions
- Constraint Based Optimization
 - Optimized for User Defined Objectives
 - Key Constraint Leverage
- Speed
 - Commitment Deferred
 - Responsiveness and Flexibility
- Collaboration
 - Customer/Supplier Aligned Decisions
 - Forecast Accuracy Improved
 - Competitive Positioning Enhanced

Business Value

Rhythm Optimization Solution Characteristics



Standard Based



Extensibility



Scalability

Comprehensive Problem Representation

- Single Logical Model
- Configurable
- Extensible

Collaboration

Speed

Constraint Based Optimization

- Global Across Engines
- Match Resolvers to Problems
- Awareness
- Resolution
- Dynamic Information Exchange
- Consensus/Resolution

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Rhythm Optimization Solution Characteristics



► Comprehensive Problem Representation

Single Logical Model: Model the complexities and robustness of multi-dimensional problems within a single comprehensive logical framework

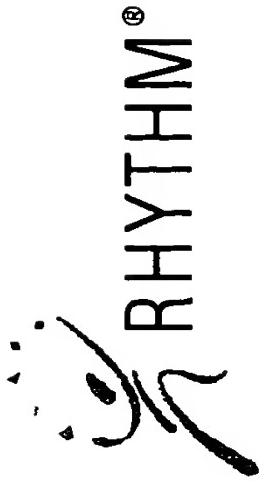
Example: SCP model can handle multiple control domains, thereby enabling Multi-Engine Optimization with local control

Configurable: Model real business environments in the computer in terms of operations, constraints, policies and objectives

Example: Modeling complex buffer inventory and replenishment policies, customized to each site and time variant

Extensible: Enable the core logic to be readily extended and enhanced without having to modify unaffected components

Rhythm Optimization Solution Characteristics



► Constraint-Based Optimization

Globally Across Engines: Optimize customer service, resources and ROA concurrently across multiple control domains and APS engines

Example: Strategy Driven Planning enables SCP to optimize across multiple sites and APS engines

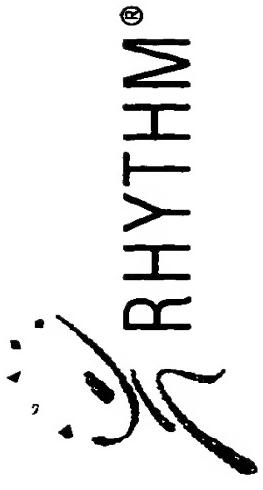
Match Resolvers to Problems: Deploy the customized decision logic, from amongst the following examples, that best fits the problem characteristics:

Examples:

- Simulated Annealing
- Linear Programming
- Holistic Techniques
- Genetic Algorithms
- Mixed Integers

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Rhythm Optimization Solution Characteristics



► Speed

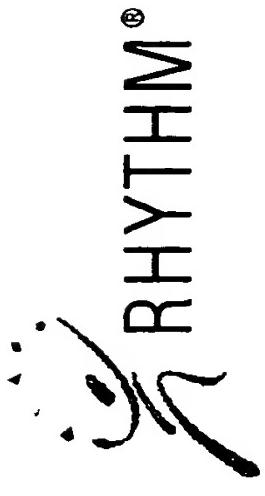
Awareness: Proactively identify challenges and opportunities, across the broadest scope, to provide maximum lead time to optimally signal and engage APS decision engines

Example: FYI Planner can proactively secure and analyze POS data to identify emerging trends in actual versus planned demand, and trigger a replanning alert

Resolution: Provide the optimal solution, from amongst a complex array of alternatives, in real time, to seize the window of opportunity

Example: SCP can respond to an ATP demand fulfillment query, based on delivery of end product to a customer ship to location, in seconds

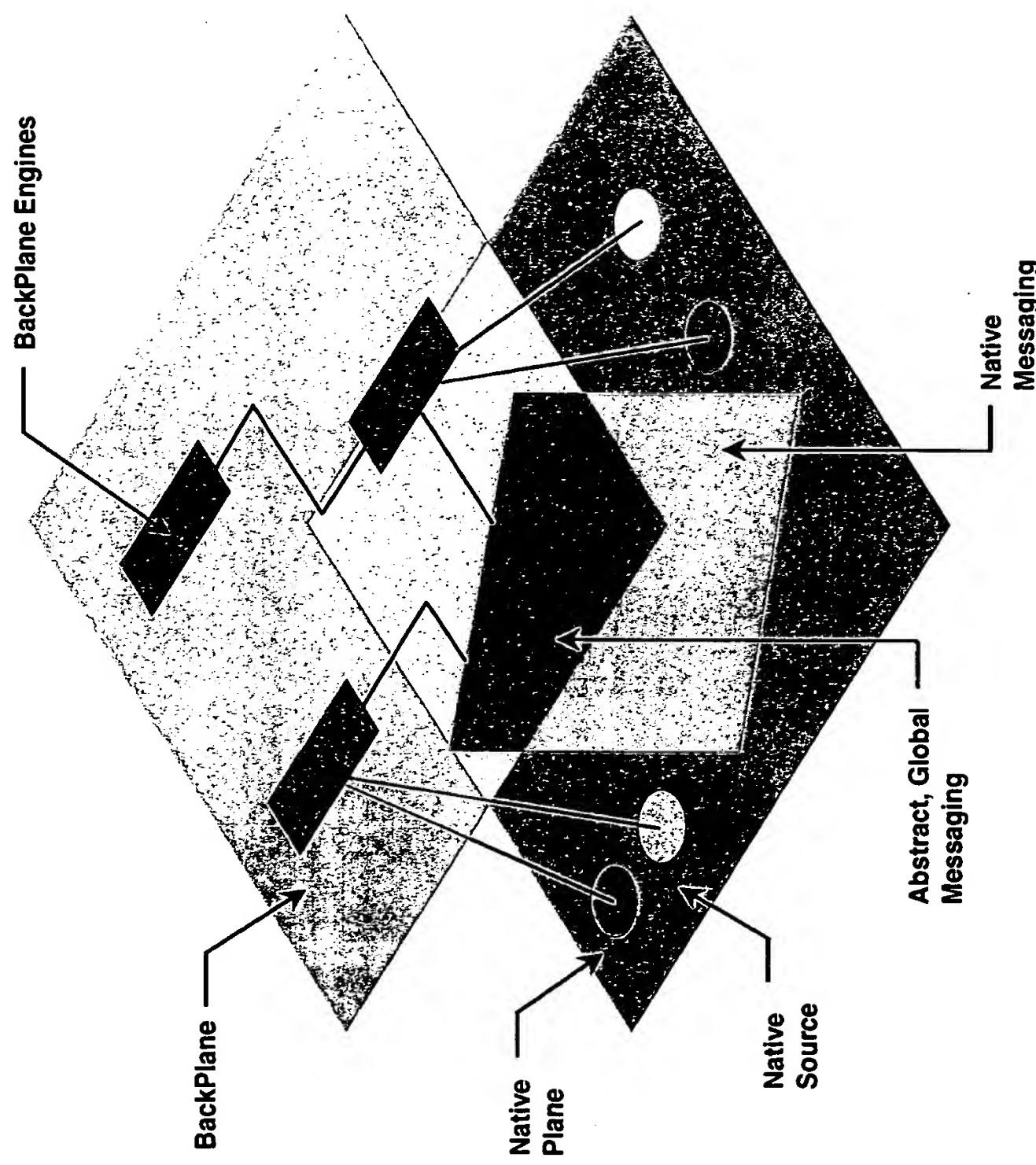
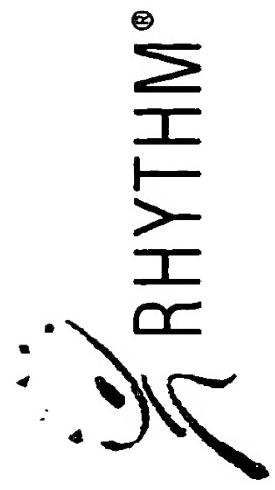
Rhythm Optimization Solution Characteristics



- Collaboration
 - Dynamic Information Exchange:** Real time access, configuration and incorporation of all relevant types of information, including data, business objects, etc.
 - Example:** Rhythmlink enables exchange of distributed objects among multiple APS engines

- Consensus/Resolution:** Drive to agreement on common information, across multiple control domains, from differing positions
- Example:** SCP Request/Promise/Commit enables multi-engine multi-enterprise collaboration on product/item requirements

Universal BackPlane Adapter

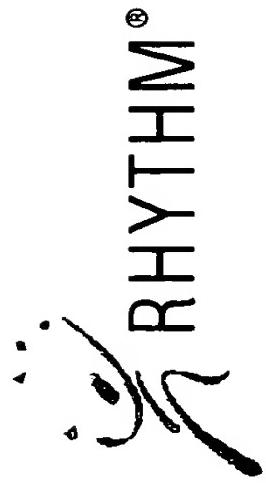


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RhythmVision Solution Characteristics

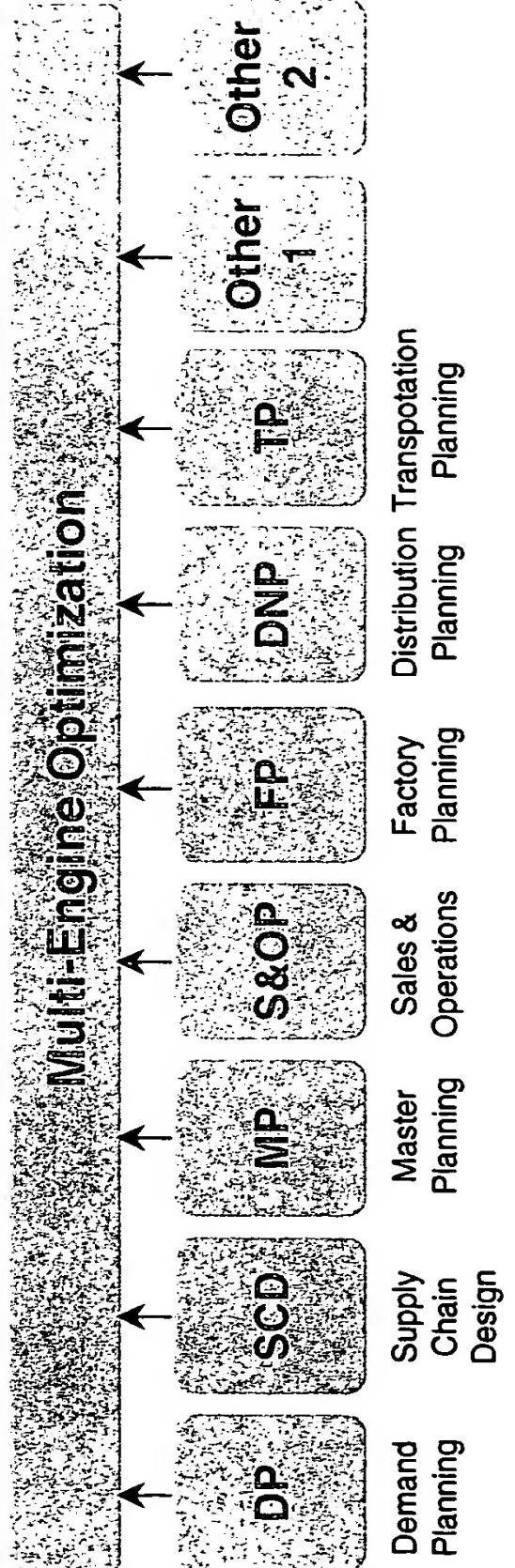


Standard Based



RhythmVision

Multi-Engine Optimization



Configurable

Integrated Workflow

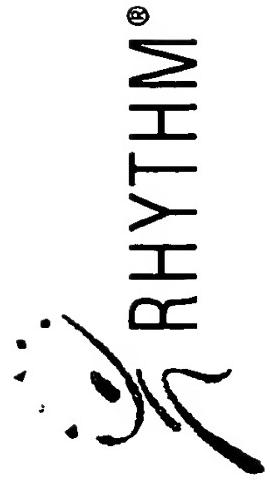
Common UI

Multi-Engine Workflow

Load Balancing

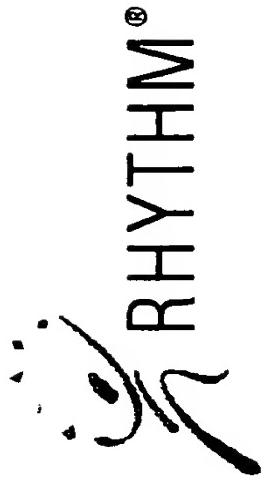
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RhythmVision Solution Characteristics



- **Configurable:** Wizard enabled User configurability
- **Integrated Workflow:** Solution driven best business practices integral component of application
- **Navigation:** Multiple highly graphical navigation methods, including supply chain modal view, Workflow Wizards, etc.
- **Common UI:** Launch all Rhythm solutions from common interface, display multi-source data on single screen
- **Multi-Engine Workflow:** Enables complex Wizard facilitated workflows involving multiple engines solutions
- **Load Balancing:** Enables optimal response times and network resource utilization in multi-engine solutions

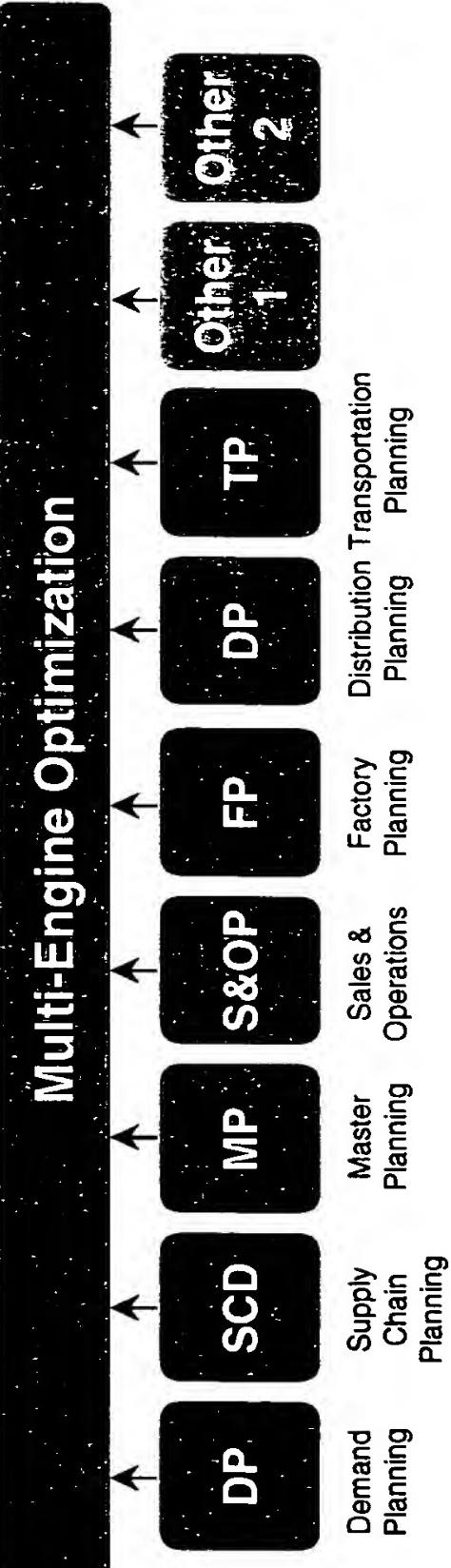
Rhythm Optimization Solution Characteristics



Standard Based



Multi-Engine Optimization



Demand Planning Supply Chain Planning Master Planning Sales & Operations Planning Factory Planning Distribution Planning Transportation Planning

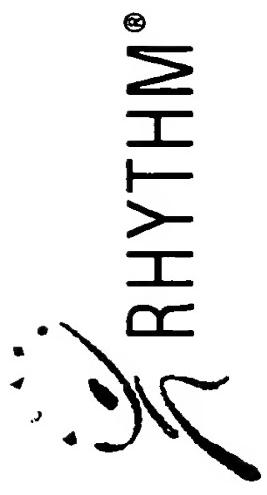
Memory Residence Model Configuration Bi-Directional Propagation Distributed Algorithms Intelligent Agents Common Object Model

Rhythm Optimization Solution Characteristics

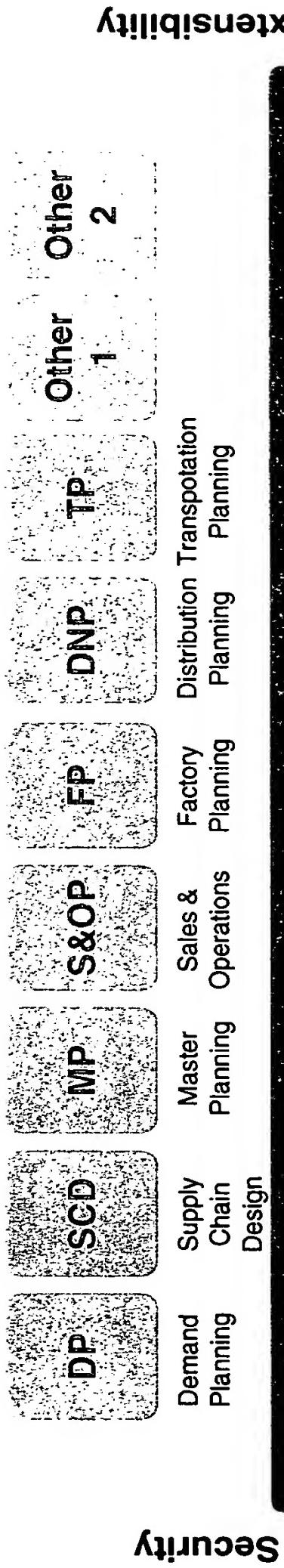


- **Memory Residence:** Results in extremely fast response times
- **Model Configuration:** Enables complex representations of solutions and multiple layered solution strategies
- **Bi-Directional Propagation:** Feasibly resolves entire problem upstream/downstream of constraints
- **Distributed Algorithms:** Enables optimization incorporating multiple APS engines and/or multiple platforms
- **Intelligent Agents:** Event triggered complex business logic shared among multiple APS engines
- **Common Object Model:** Shared business logic enables multi-engine solutions

RhythmLink Data Integration Solution Characteristics

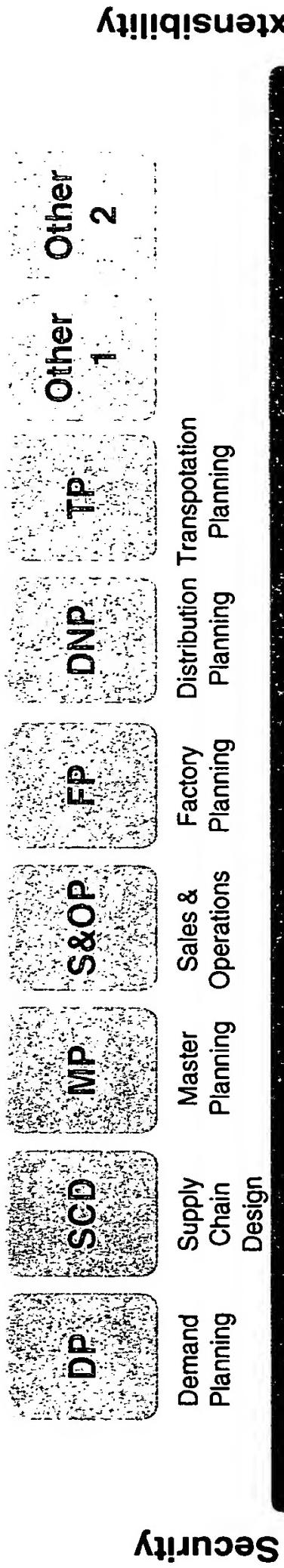


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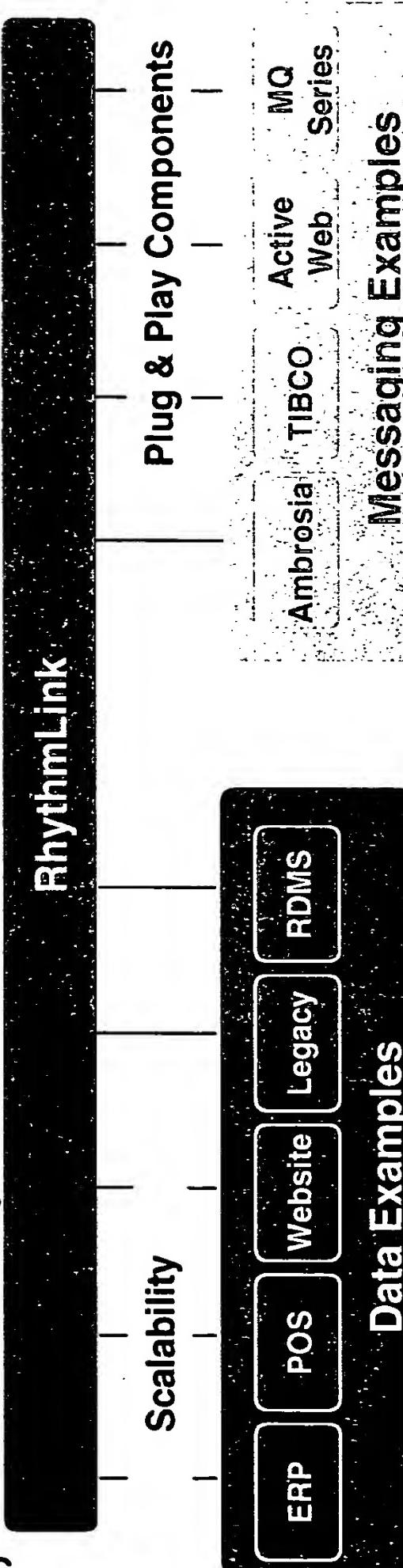


Security

Object Orientation



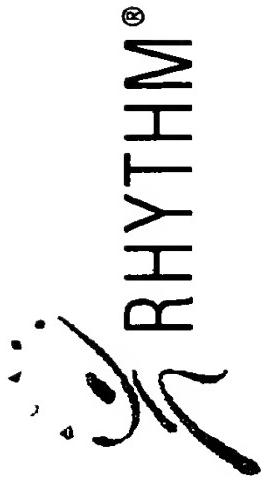
Extensibility



Multi-Source Information Configuration Data Permanence Data Multi-Sourcing Synchronization Common Data Model

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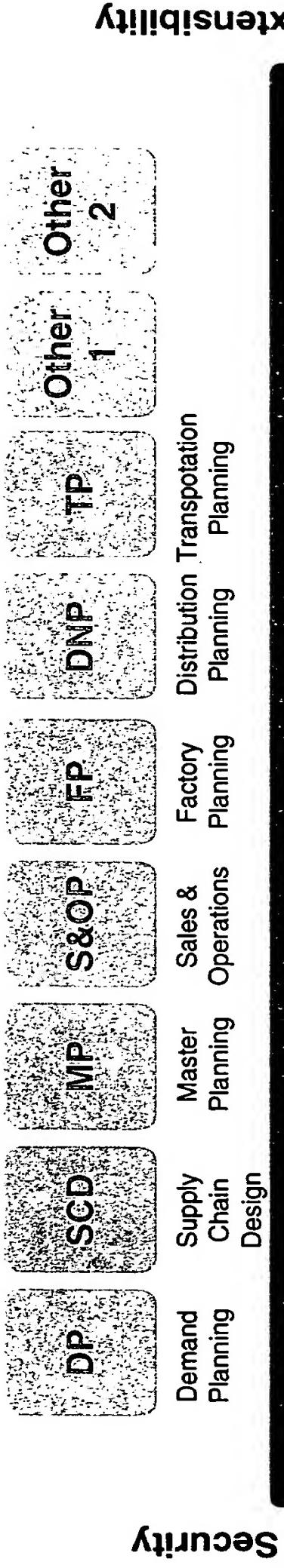
RhythmLink Data Integration Solution Characteristics



- **Multi-Source Data:** Access data from multiple information sources simultaneously including ERP, POS, Legacy, etc.
- **Data Configuration:** Adapt data with different definitions of Product, Location, Time, etc to a common framework
- **Data Permanence:** Ensures data consistency and retention
- **Multi-Sourcing Synchronization:** Ensures time integrity and consistency of data sourced from multiple locations
- **Common Data Model:** Enables complex analysis of information from multiple sources based on translation to common definition

RhythmLink Global Message Bus Solution Characteristics

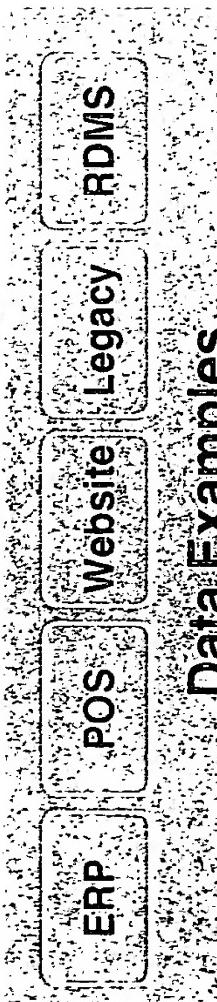
Standard Based



RhythmLink

Scalability

Plug & Play Components



Data Examples

Messaging Examples



Global
Messaging

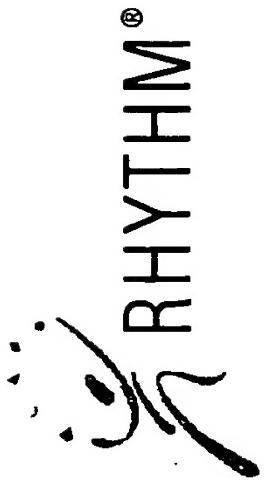
AEWS/
Signaling

i2 Technologies

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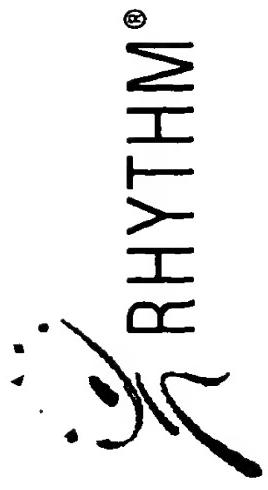
RHYTHM[®]

RhythmLink Global Message Bus Solution Characteristics



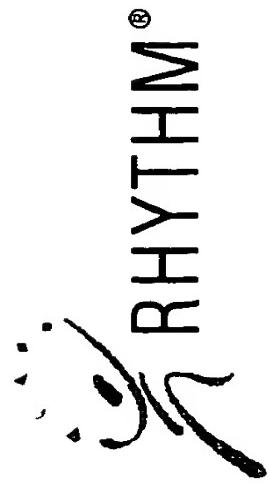
- **Global Messaging:** Supports complex one-to-many closed loop collaboration and object focused dialog
- **AEWS/Signaling:** Enables proactive multi-engine Advanced Early Warning System with integrated workflow to engage APS engines

Multi-Enterprise Solution Example: Single Face To Customer



| Solution Requirement | Business Value |
|--|---|
| • Global Demand Fulfillment via Global Sourcing | <ul style="list-style-type: none">• Prioritized Customer Service• Improved Customer Fill Rates |
| • Demand Prioritization based on Product, Customer, Location, etc. | <ul style="list-style-type: none">• Improved Responsiveness |
| • Multi Product, Multi Ship To, Multi Ship When | <ul style="list-style-type: none">• Reduced Order Cycle Time• Reduced Inventories |
| • Combinations of Make To Stock, Make To Order, Configure To Order, etc. | <ul style="list-style-type: none">• Increased Customer Market Share and Revenues |
| • Substitution Alternatives for Product, Ship To and Ship When | <ul style="list-style-type: none">• Increased Customer Market Share Stability |
| • Demand Commit, Order Tracking, Order Status | <ul style="list-style-type: none">• Improved Customer Satisfaction |
| • Advanced Early Warning System | <ul style="list-style-type: none">• Reduced Sales Costs• Improved Asset Utilization |

Phase I: Available Now



► Rhythm Optimization Solutions

- Strategic Business Planning
- Master Planning
- Demand Planning
- Manufacturing Planning

- Distribution Planning
- Transportation Planning
- Order Promising
- Scheduling

► RhythmLink

- Comprehensive multi-directional multi-source data extraction, manipulation and configuration
- Dynamic UI based capability to reconfigure data requirements
- Distributed Objects

► RhythmVision

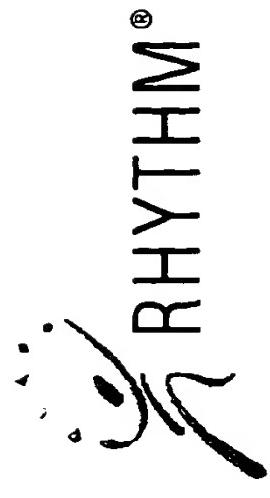
- Common UI architecture supporting multiple UI types across multiple data sources and APS engines
- Wizard based best practices workflow
- Common components, extensibility, security and user model
- Common UI data model, routing and load balancing

i2 Technologies

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i2 Technologies

Phase II: Available December 31 '97



► **RhythmLink**

Global Messaging:

Secure, closed loop object focused dialogue, publish and subscribe broadcasting

Supply Chain Architect:

Enables rapid Wizard based common model generation, auto configuration and auto sourcing of multi-engine solutions

Business Object Servers:

Create complex business objects from multiple, diverse data sources via Business Object Driver Adaptors

Fault-Tolerant 24X7 Servers:

Guaranteed Global ATP uptime

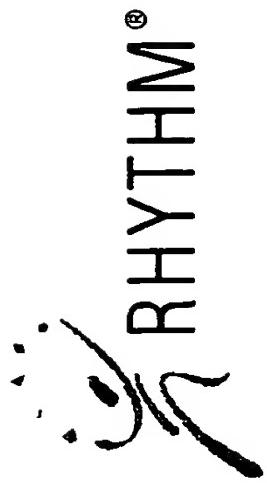
► **RhythmVision**

Multi-Enterprise Best Practices Templates:

User configurable Wizards that provide best practice roadmaps for solving multi-enterprise and multi APS business problems

i2 Techniques

Phase III: Available by July 31 '98



► Rhythm Optimization Solutions

- Sales & Operations Planning
- Demand Creation
- Global Inventory Manager
- Web Based Co Managed Inventories
- Global Demand Fulfillment
- Web Based ATP and DDQ
- Web Based Collaborative Forecasting and Replenishment

► RhythmLink

Security:

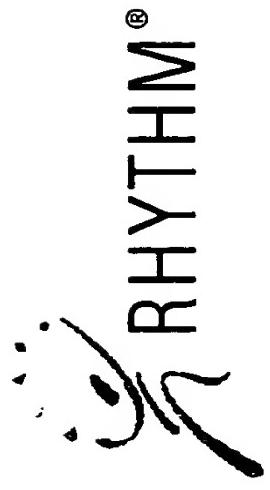
Comprehensive client and server level security, down to object level

► RhythmVision

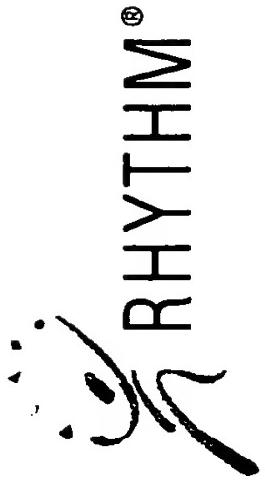
Global Early Warning System:

Robust, proactive multi-engine and multi-source prioritized signaling and workflow

Summary



- Optimized Decision Making Drives ROA
- Optimized Decision Making requires technology that supports multiple decision engines and diverse information sources
- i2 provides applications an open architecture that delivers maximum value

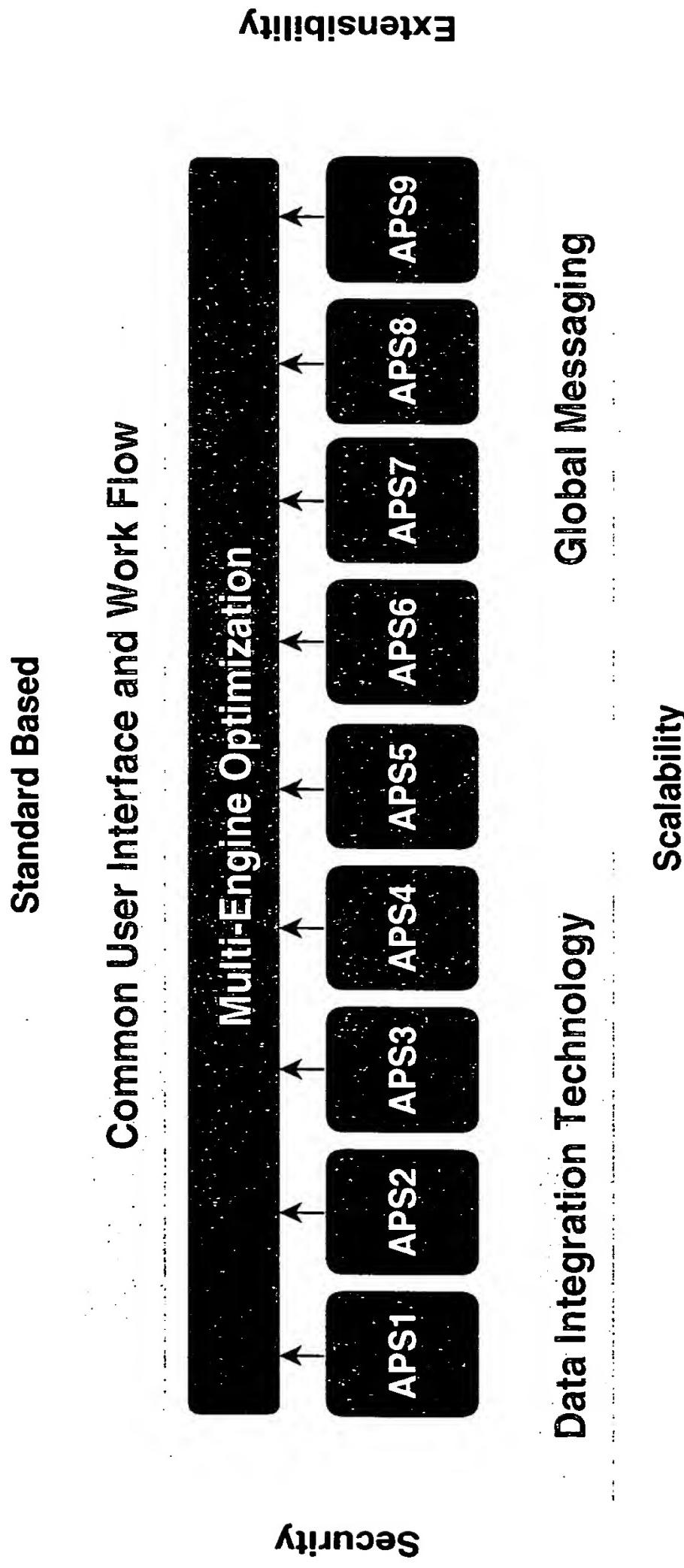
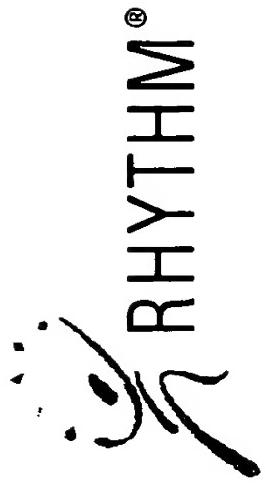


BACKUP SLIDES

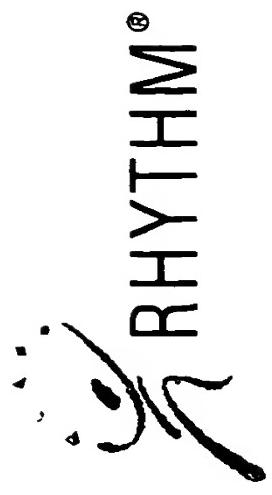
i2 Techniques

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World Class Decision Support Solution Characteristics

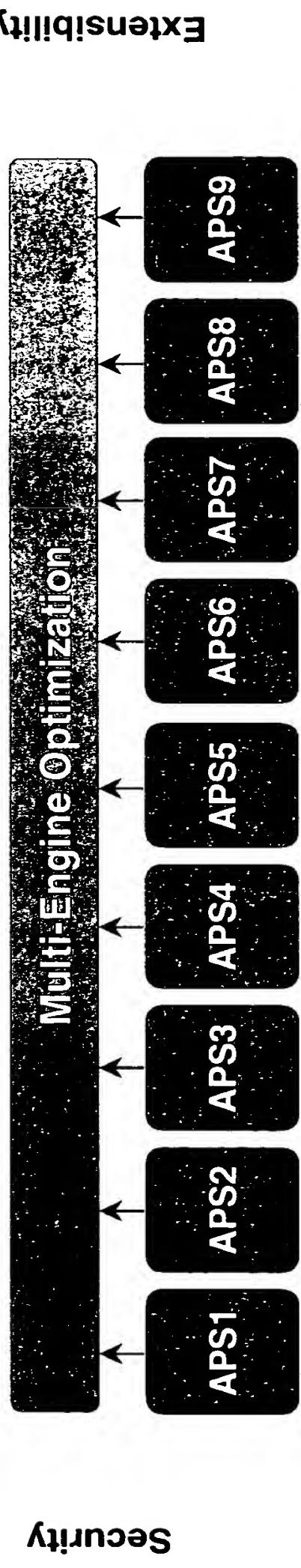


World Class Decision Support Solution Characteristics



Standard Based

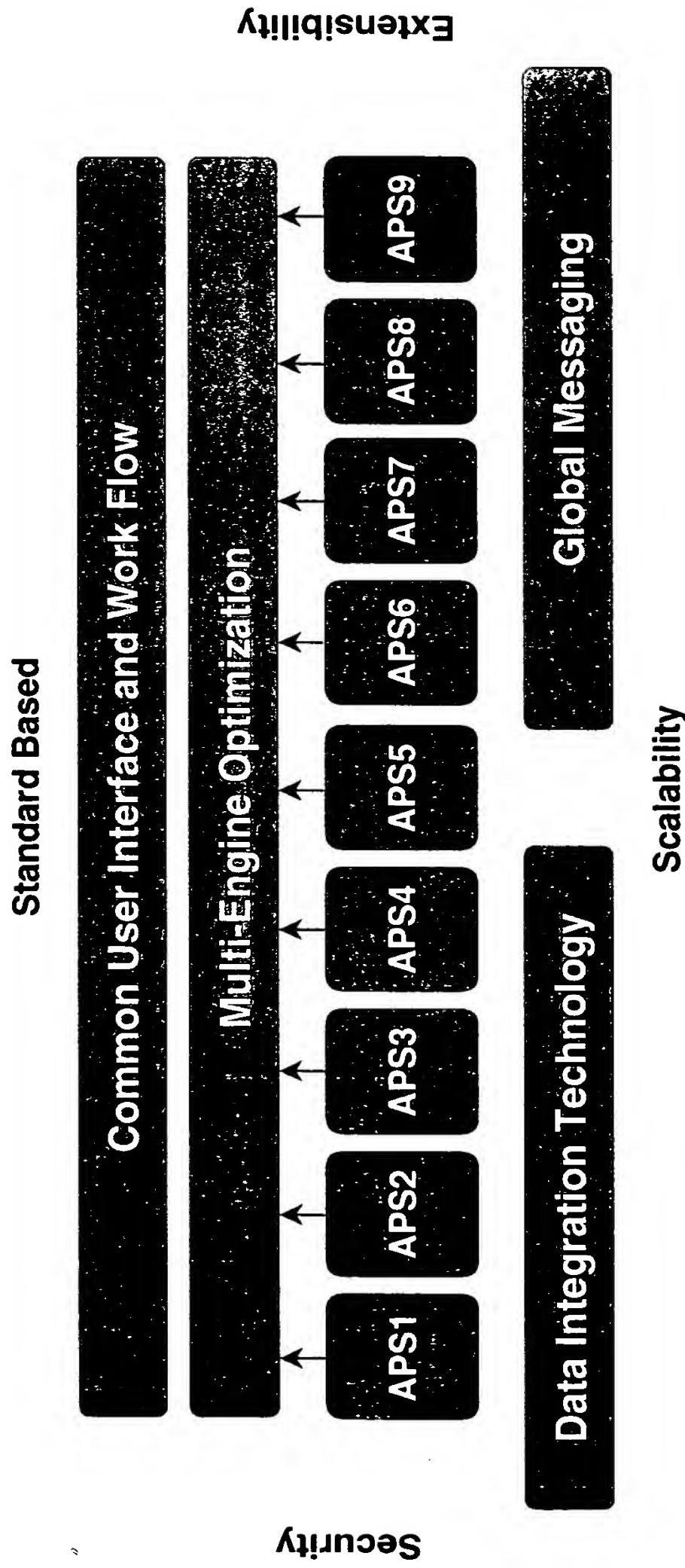
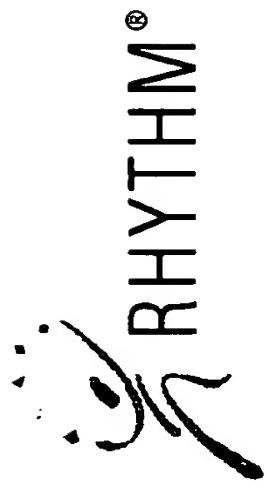
Common User Interface and Work Flow



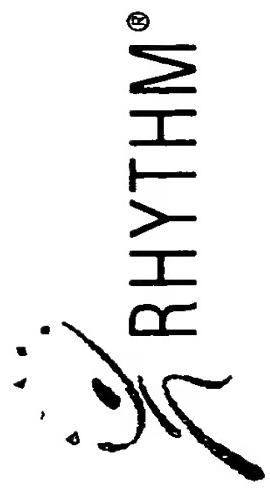
Comprehensive Problem Representation Constraint Based Optimization Speed Collaboration

- Single Logical Model
- Configurable
- Extensible
- Global Across Engines
- Match Resolvers to Problems
- Awareness
- Resolution
- Dynamic Information Exchange
- Consensus/Resolution

World Class Decision Support Architecture



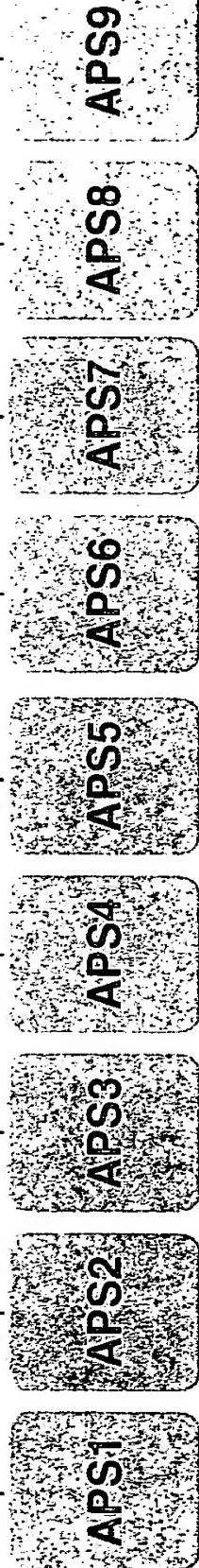
Decision Support Single Engine: Solution Characteristics



Standard Based

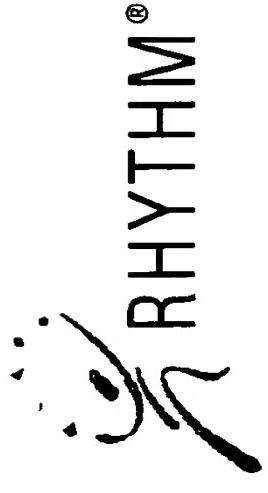
Common User Interface and Work Flow

Multi-Engine Optimization

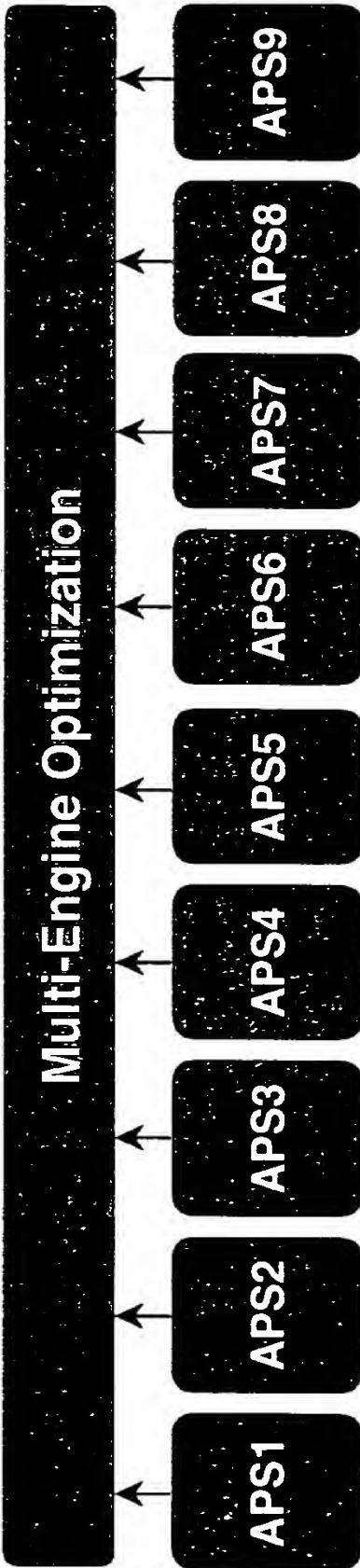


Configurable Best Navigation
Practices Workflow

Decision Support Single Engine: Solution Characteristics

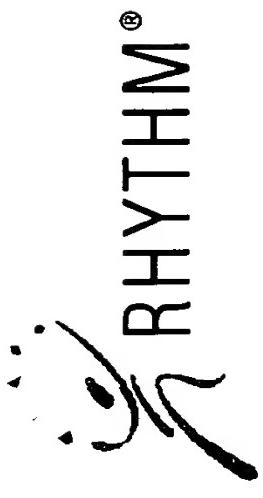


Standard Based

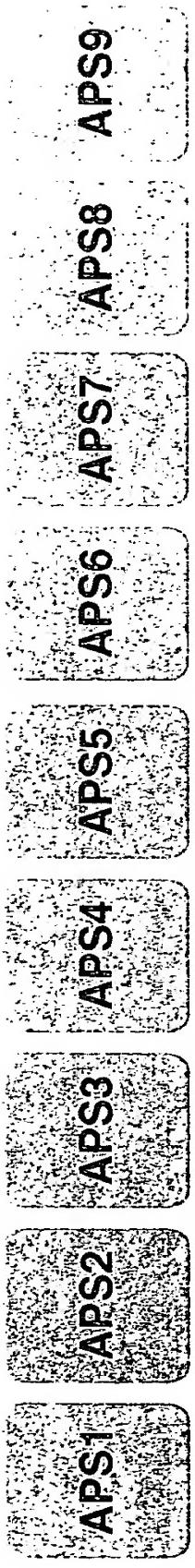


Memory Residence
Model Configuration
Bi-Directional Propagation

Decision Support Single Engine: Solution Characteristics

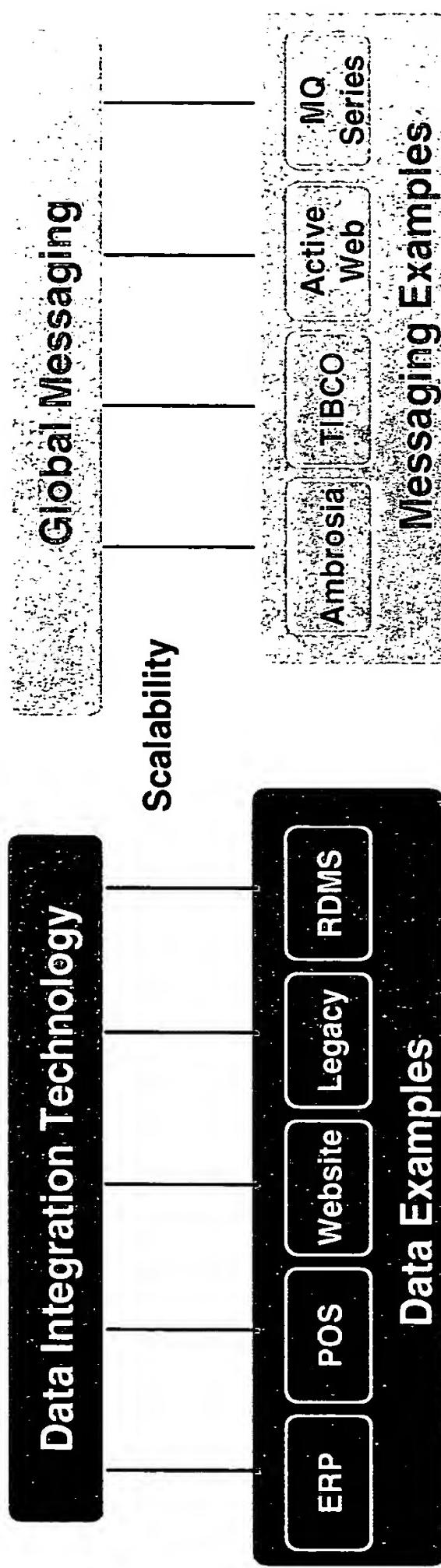


Standard Based



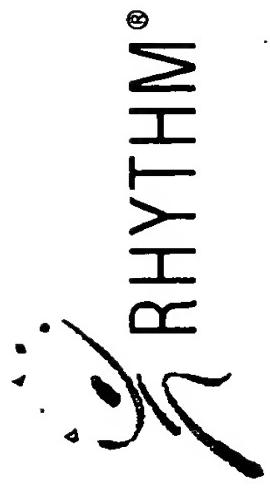
Object Orientation

Data Integration Technology



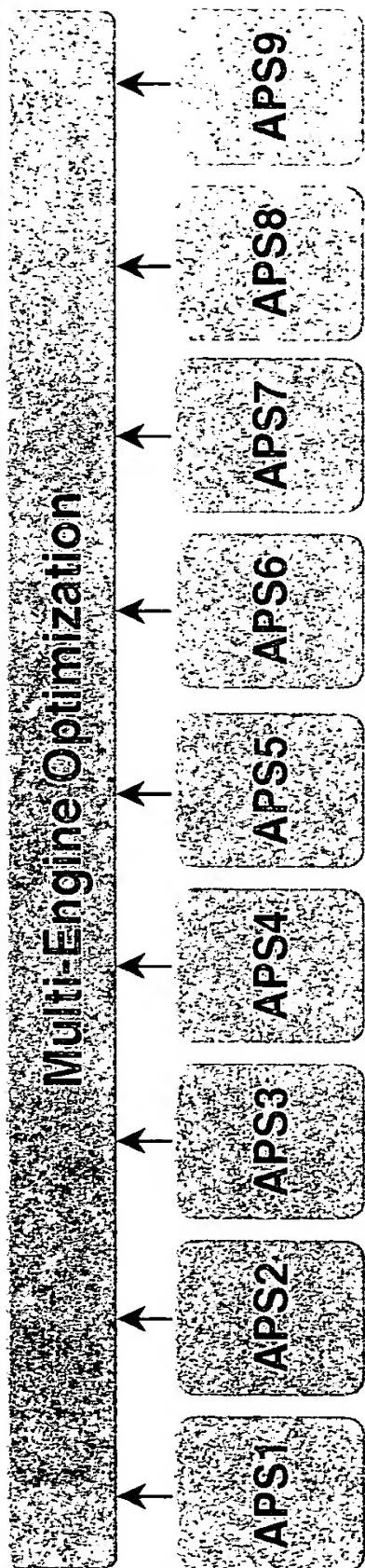
Multi-Source Information Data Configuration Data Permanence

Decision Support Multi-Engine: Solution Characteristics



Standard Based

Common User Interface and Work Flow



Configurable

Integrated Workflow

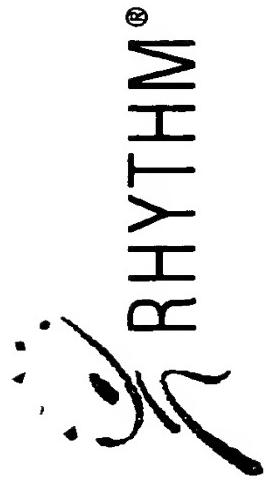
Navigation

Common UI

VIB
Load
Balancing

i2 Technologies

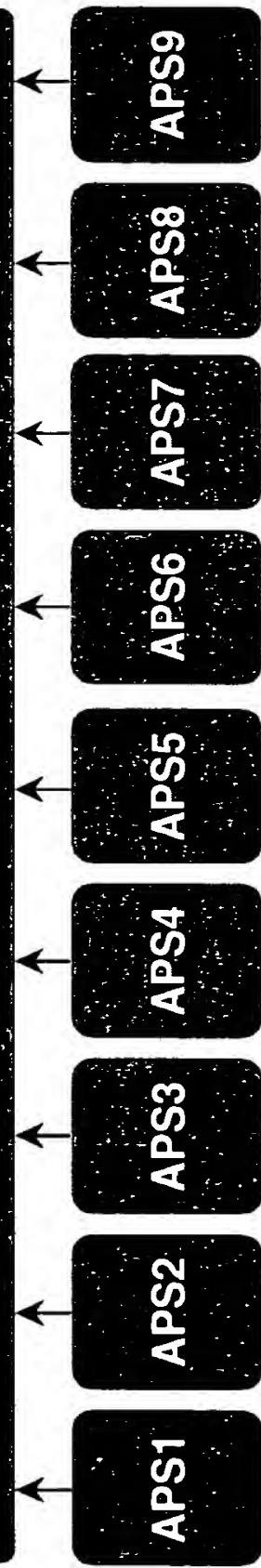
Decision Support Multi-Engine: Solution Characteristics



Standard Based

Common User Interface and Work Flow

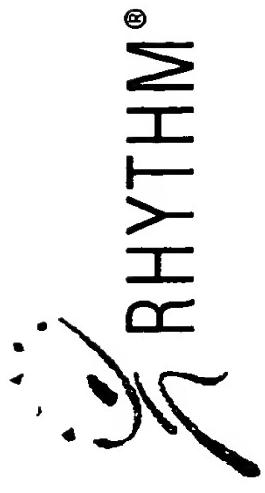
Multi-Engine Optimization



Memory Residence
Model Configuration
Bi-Directional Propagation
Distributed Algorithms
Intelligent Agents
Common Object Model

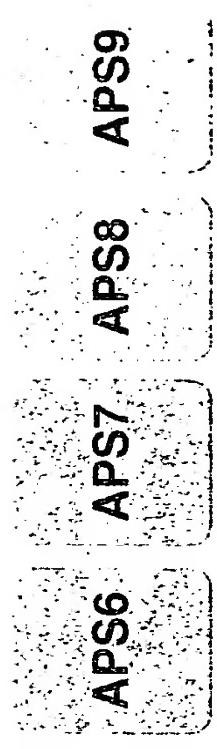
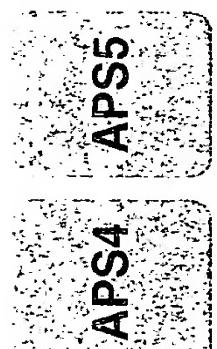
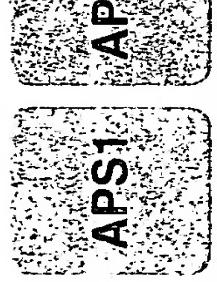
i2 Technologies

Decision Support Multi-Engine: Solution Characteristics



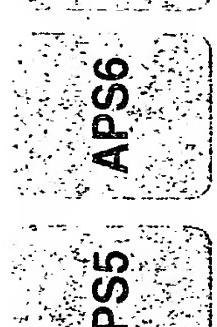
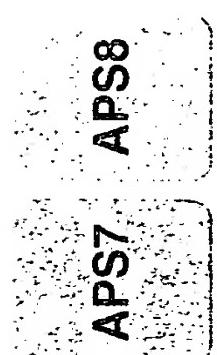
Standard Based

Security



Object Orientation

Extensibility



Data Integration Technology

Scalability

Plug & Play Components



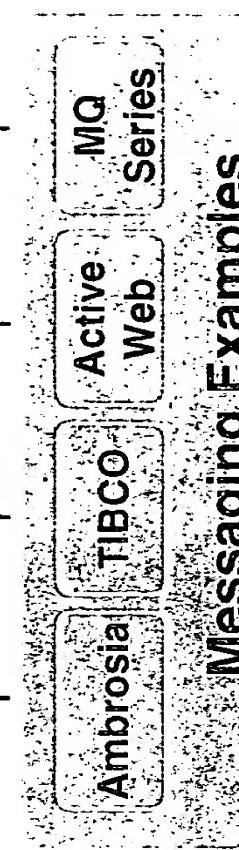
Multi-Source
Information

Data
Configuration

Multi-Sourcing
Permanence

Common
Data Model

Global Messaging



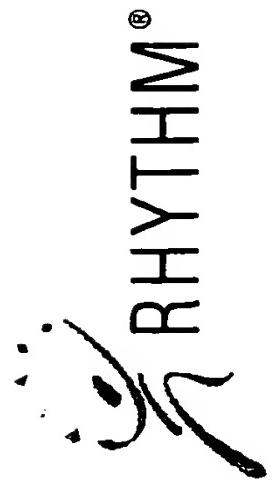
Messaging Examples

i2 Technologies

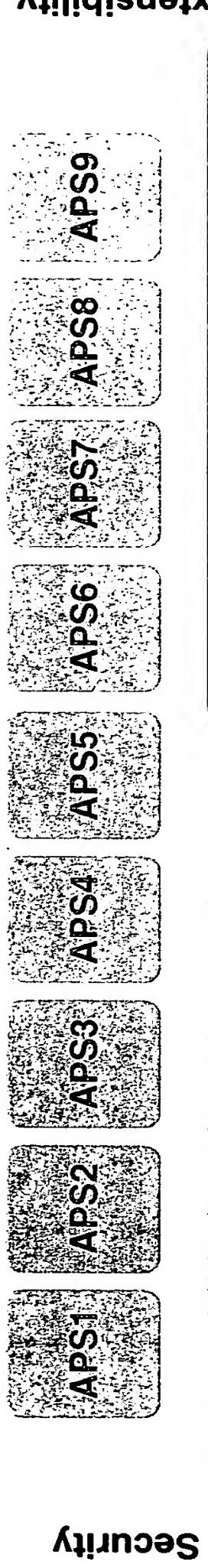
57

Extensibility

Decision Support Multi-Engine: Solution Characteristics

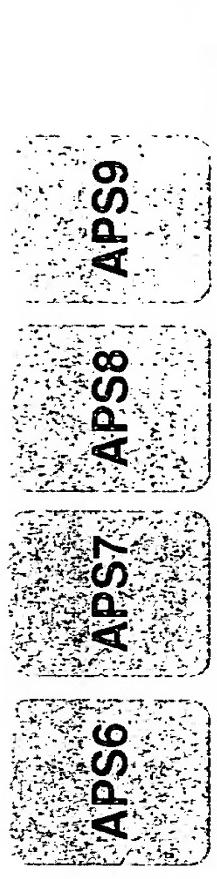


Standard Based



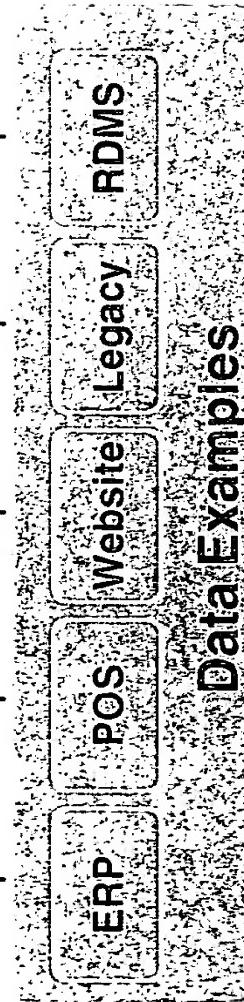
Security

Object Orientation



Data Integration Technology

Scalability



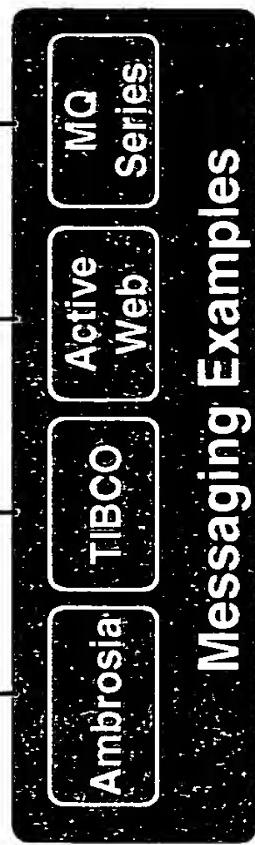
Legacy

RDMS

Data Examples

Global Messaging

Plug & Play Components



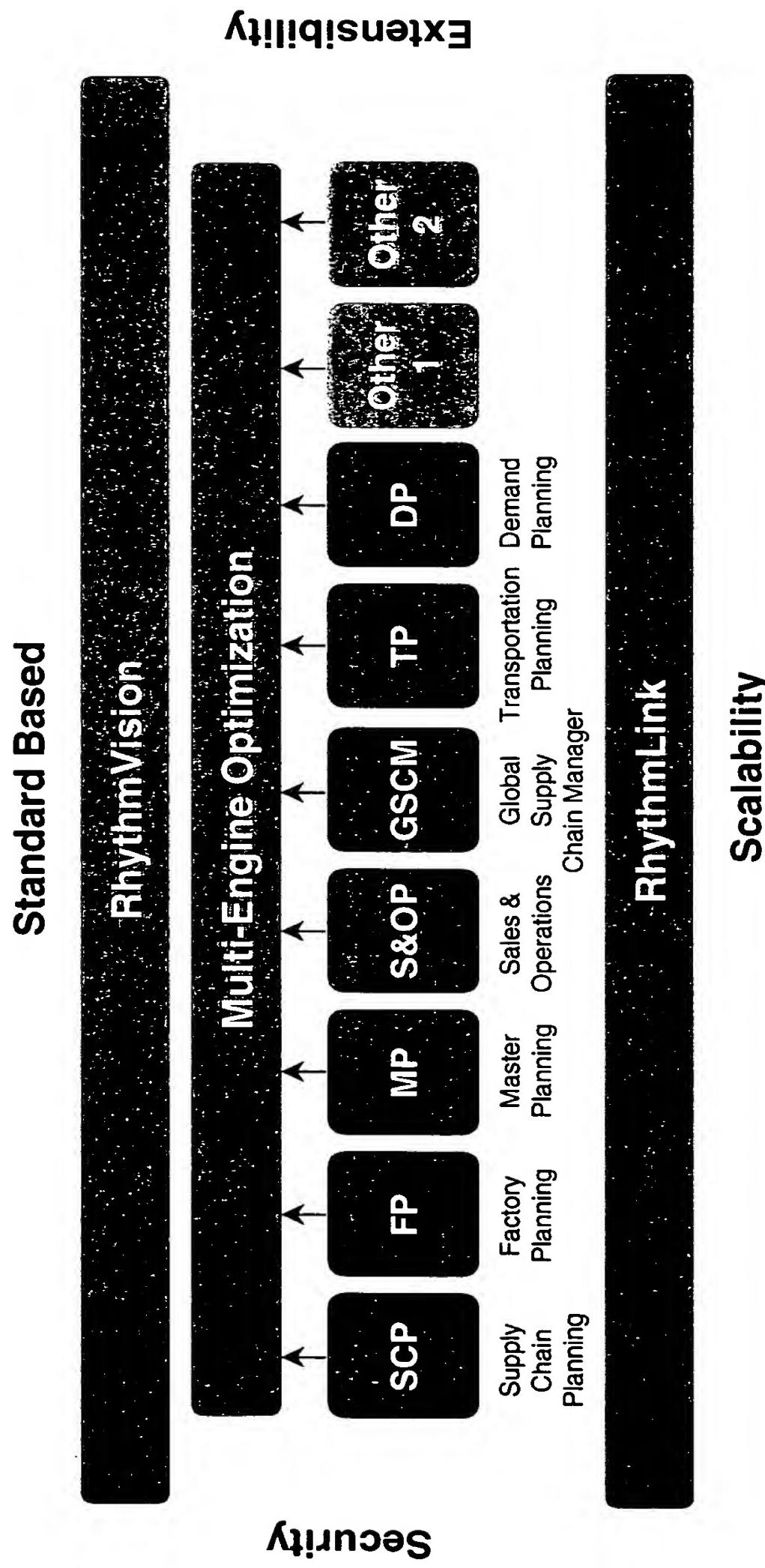
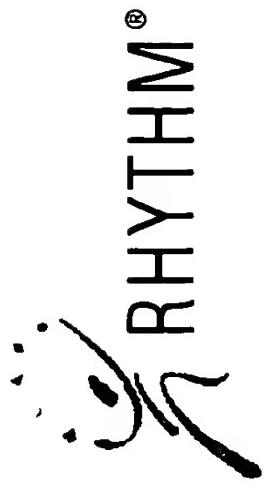
Messaging Examples

Global
Messaging

AWS/
Signaling

i2 Technologies

Rhythm Decision Support Architecture



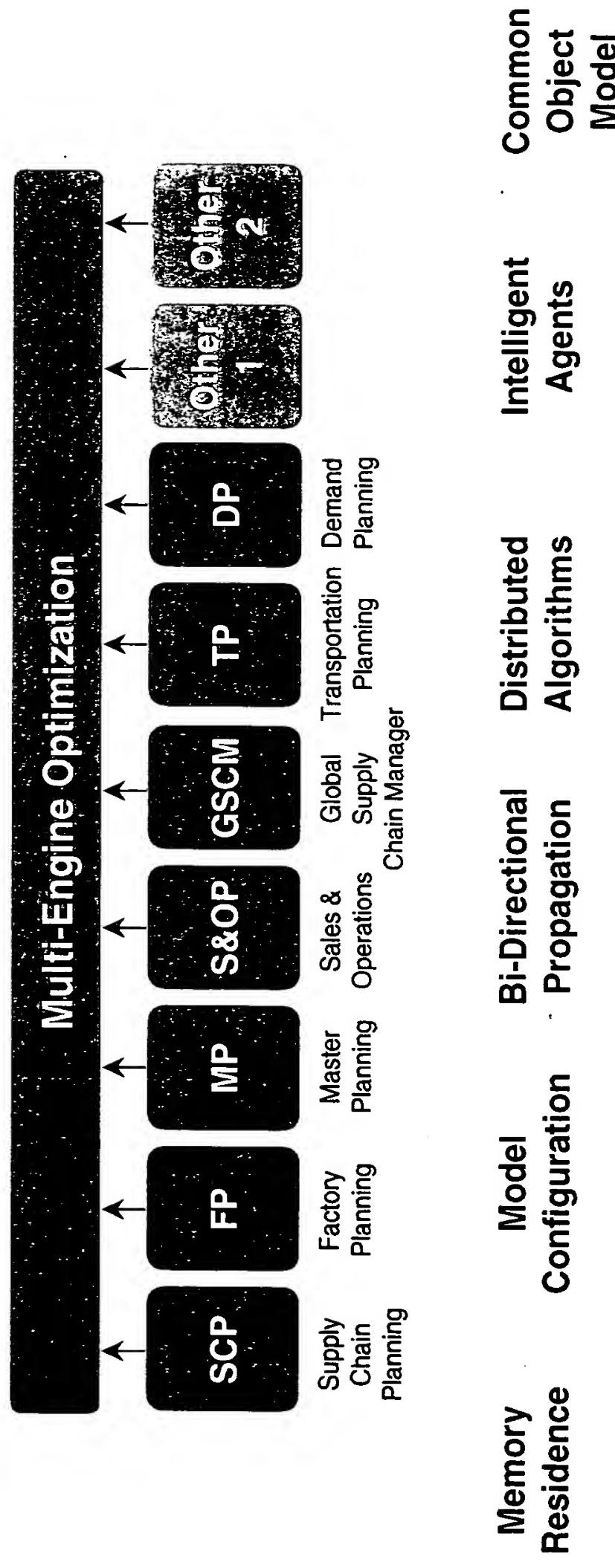
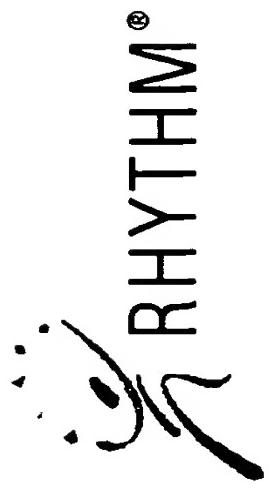
RhythmVision Solution Characteristics



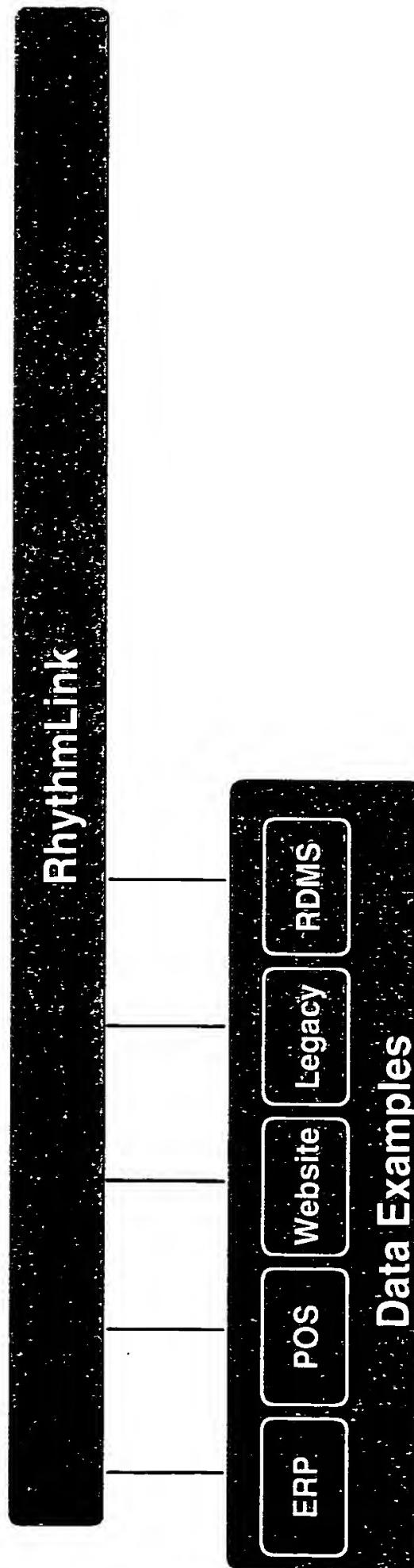
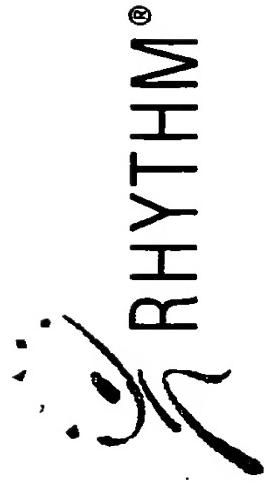
RhythmVision

- Configurable
- Integrated Workflow
- Navigation
- Common UI
- Multi-Engine Workflow
- VIB Load Balancing

Rhythm Optimization Solution Characteristics

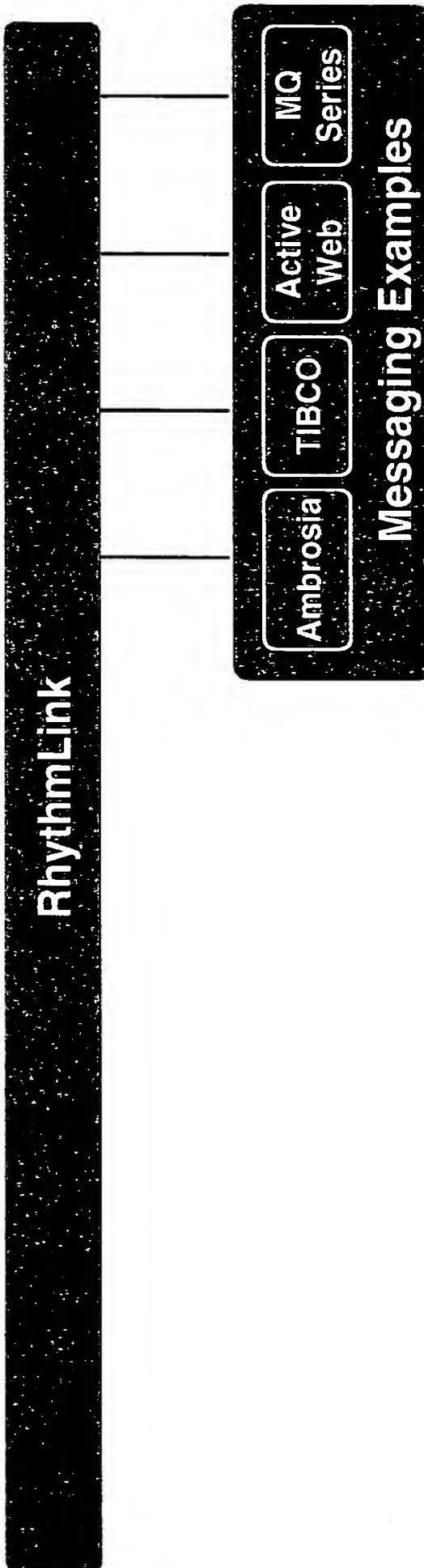
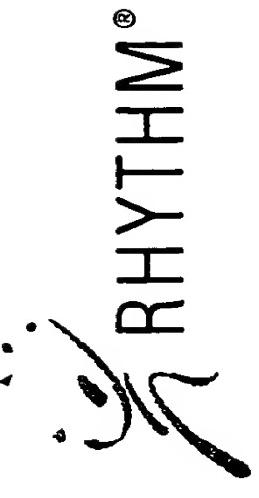


Rhythmlink Data Integration Solution Characteristics



| Multi-Source Information | Data Configuration | Data Permanence | Data Synchronization | Common Data Model |
|--------------------------|--------------------|-----------------|----------------------|-------------------|
| | | | | |

RhythmLink Global Message Bus Solution Characteristics



Global
Messaging

AWS/
Signaling

i2 Technologies

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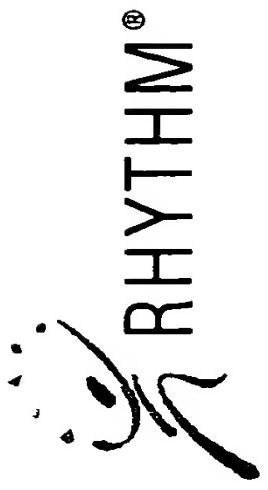
Alliance Partners

- ▷ (Mike Ellis)

RHYTHM®

Solutions for World Class Partners

- Change Management
- Organizational Redesign
- Performance Metric Redesign
- Business Process Re-Engineering
- Business Process Re-Training
- Systems Integration



Solutions for World Class Implementation

- ▷ Speed to ROA
- ▷ Value Pricing
- ▷ Technology Transfer
- ▷ Training
- ▷ Project Management
- ▷ Business Release Methodology
- ▷ Model Configuration
- ▷ Data Definition and Integration

